

Module 1. How can we train taking a holistic approach in basketball?

Once we analyzed Barcelona Football Club's methodology based on structured training, we know that this training is mainly based on two areas: the coadjuvant training and the optimizer training. These two areas are supported by the building of preferential simulating tasks as a central point to communicate the training we want to carry out. This way, we mainly organize training in the structured microcycle, which will be the training functional unit.

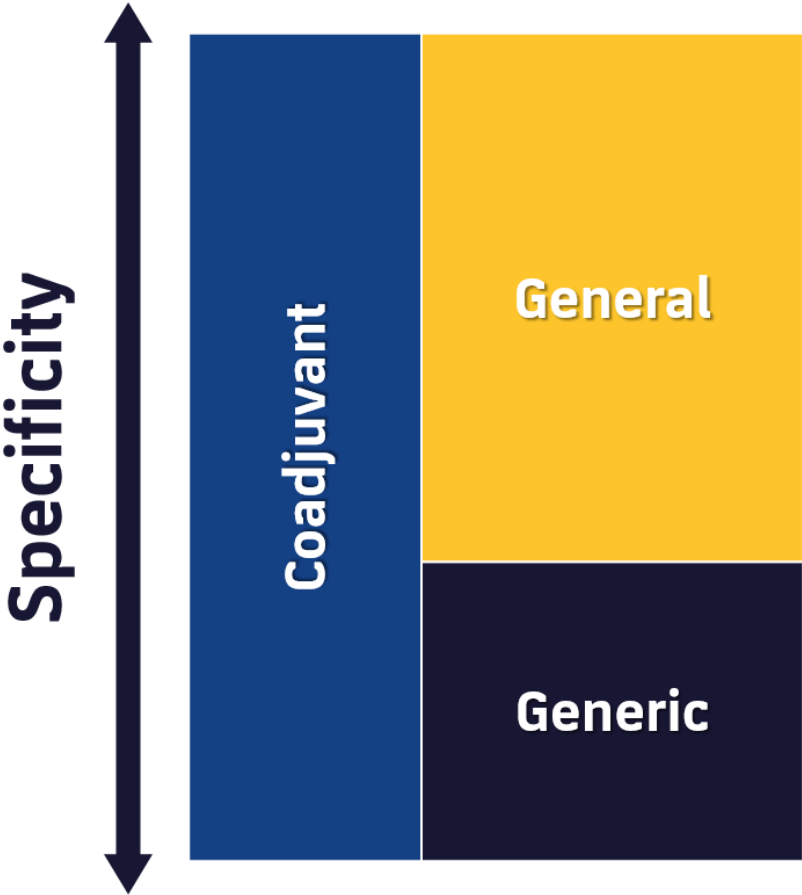
In order to organize training and taking structured training methodology into account, we distinguish three criteria: The first one would be the temporal criterion. That is, we know that seasons are divided in three phases: preseason, season and active rest. The second one would be the intrathematic criterion, which is based mainly on the orientation, that is, in the specificity of each one of the tasks related to the match or competition. And the third one is the interthematic criterion, which deals with the synergic conjecture proposals. That is, the ability for interaction among different content, so that they produce the best possible result in the interaction.

This information, which is theoretical and general, will be reflected, from now, in a proposal based on different orientations and approximation levels for basketball.

This way, we can distinguish five orientations with ten levels. In the first place, we find the coadjuvant training with a low specificity level, with generic and general orientations.



Figure 1: Specificity level for the coadjuvant training



Source: Own creation.

These two the general and the generic orientation, in turn, will also be supported by the directed one. The directed orientation is in parallel with the optimizer training and the coadjuvant training. Just as we can appreciate in figure 2, general orientation contains the unoriented level zero, which includes the non-specific movements that are not based in sprint and in which there is no decision making.



Figure 2: Training classification according to structured model for Approximation levels from 0 to 3

| | | | | |
|-------------------------------|----------|---|--|--|
| Coadyuvant - optimizer | DIRECTED | LEVEL III Tactical - tecnic | Exercises with or without passive opposition (3on0, 4on0 y 5on0). Simple and specific decision making | Specific movements 3on5on0 ball simple DECISION MAKING (DM) [WITH BALL] >cognitive |
| | | LEVEL II Technical. Technical – tactical | Exercises with or without passive opposition (1on0 y 2on0). Simple and specific decision making | Specific movements 1on0 and 2on0 with ball simple DM > coordinative |
| Generic - coadyuvant | GENERAL | LEVEL I Conditional – coadyuvant | Actions and movement parameters similar to basketball. No decision making or simple decision making. | Specific movements without ball nor DM [WITHOUT BALL] |
| | | LEVEL 0 + (oriented) Conditional – coadyuvant | The physical activity performed has no relation with basketball. More specific movement patterns than in a Level 0-. No decision making. | Nonspecific movements but based on running no DM |
| | GENERIC | LEVEL 0 – (unoriented) Conditional – coadyuvant | The physical activity performed has no relation with basketball. Nonspecific movement patterns. No decision making. | Nonspecific movements NOT based on running no DM |

Source: Own creation.

Oriented level zero includes all of non-specific movements, but already based on sprint and without decision making. Level 1 includes basketball specific movements without a ball and without decision making. When we go to another section, in this case optimizer coadyuvant group, inside directed orientation we find level 2, based mainly on coordinative and cognitive structures, what is generally known as technical-tactical, but with a preference for technical. These are exercises without opposition or with passive opposition, plain specific movement exercises one against zero or two against zero, without ball and without decision making or with simple decision making, with a clear preference for coordinative structure.

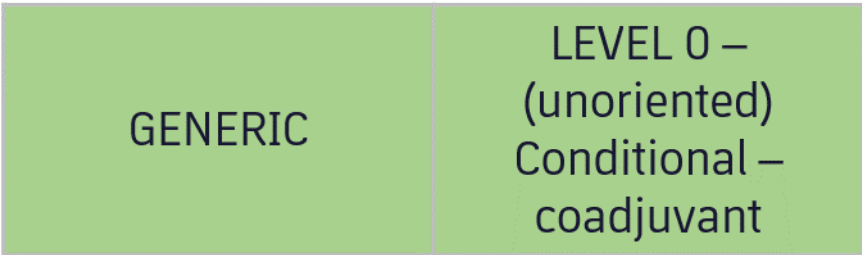
The tactical-technical or cognitive-coordinative level 3 includes specific movements in three against zero, four against zero and five against zero with ball and with very basic decision making. The main focus is the cognitive-tactical structure. The preference for these two last levels could be also directed mainly to the conditional structure.

An example for an unoriented level generic training focused on the conditional structure could be to develop a task with a main goal to develop and stimulate the conditional and bioenergetic structure.

This way we can develop the aerobic system by proposing an efficiency task based on the work of less than 65% of the maximum heart rate, doing a 45 minutes circuit on a bicycle outdoor.



Figure 3: Example of an unoriented level 0 task for aerobic system optimization



Conditional structure

Aerobic system < 56% MAX Heart Rate
(HR) 45' OUTDOOR BICYCLE

ACTIVE rest phase

4.500–7.500 m

Source: Own creation.

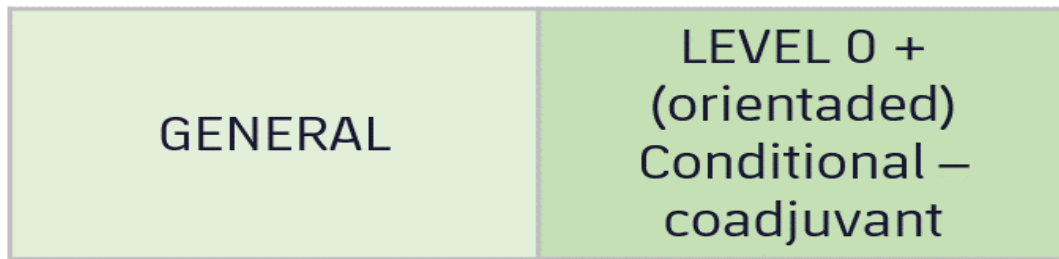
This would be mainly within the first organization criterion, located in the active rest phase. The idea is that we can meet the aerobic system demands, which is to cover between 4500 and 7000 meters, according to literature.

In our data taken with positioning systems devices we would be referring to what we need to get ready, in average, for a 5 kilometers distance. This could happen more when players play, for example, for 35 or 40 minutes, something that is less frequent in basketball these days.

In relation to the general oriented level zero work, we would focus; once more, on the conditional and bioenergetic structure, developing in this case the aerobic system, specifically the capacity. To this end we propose, for example, three series of eight minutes to the 80-90% maximum heart rate, with a density of 2-4 for work and 1 for rest.



Figure 4: Example of an oriented level zero task to optimize conditional structure (aerobic capacity)



Conditional structure

AEROBIC SYSTEM CAPACITY

3*8' 80-90% MAX HR 2-4:1

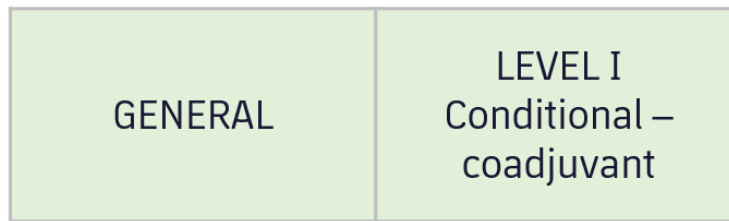
ACTIVE REST phase and/or preseason

Source: Own creation.

This might also happen in the active rest phase mainly and punctually in relation to the preseason duration and to the team needs in preseason.

In relation to level 1, we establish a hiit work, which will be long, in this case, due to duration: it will include periods longer than 60 seconds. As an example, we can establish 3 to 5 minutes long tasks, based on 90-100% maximum heart rate, and with a density of 1-2 to 1 and the example could be 4 series of 3 minutes to the 95% maximum heart rate.

Figure 5: Level 1 task for conditional structure optimization (aerobic power)



LONG HIIT >60"
3-5' AEROBIC POWER 90-100% MAX HR
1-2:1 4*3' 95% MAX HR
ACTIVE REST phase and/or preseason

SHORT HIIT <60"
40-60" POWER AND AER-ANAER TRANSITION 90-100% MAX HR
1-2:1 3*(3 of 45" with 45" pause y 3' pause) preseason

Source: Own creation.

This work might also be mainly directed in the active rest phase, although we could use it precisely, as we expressed, according to the team needs and characteristics during preseason. Another option to develop level 1 could be short hiit, which includes less than 60 seconds periods. This way, we can work from 40 to 60 seconds, basing on the development of power and transition between the aerobic phase and the anaerobic one, which would include between 90 and 100% maximum heart rate, with a density of 1-2 to 1. The example might be three series composed of three 45-seconds repetitions, with a 45-seconds pause between repetitions and a 3-minutes rest between pauses. This work would be designed mainly for preseason phase. This last less-than-60-seconds hiit work we propose, 45-seconds repetitions in this case, could be done in a circuit that would include different movements like blocking a shot, diagonal shuffle, run from the baseline; later the player could pick a medicine ball and perform a countermovement jump, he could come back in transition, run in the opposite direction, repeat when getting to the baseline. This is another star shape exercise, like the ones we did at the beginning, in which we propose diagonal shuffle achieving a star shape, and we repeat, coming back in transition to the other side.

We have given data of the first organization criterion, that is, in the phase in which preseason, active rest or season are developed. We have established a specificity level in the orientation, that is, to establish if it is generic or other and it will be necessary also to



cover the following aspect: the interthematic, the one that considers synergic conjectures proposals. That is, we should see how these works are organized, so that they coincide in the best possible way.

These exercises might be part of a type of work in which conditional capacities are part of the resistance orientation, that is, resistance work. To this end and in relation to the technology topics we have discussed here, we should prepare our basketball sports human beings to support an average of a 210 meters high intensity distance faster than 18km/h, being able to reach 300 meters. Besides, we could also have into account the average for the number of high intensity distance times, which could be an average of 18 times, which would exceed 18 km/h, reaching even 25/h.

Peak speed we can reach during an approximate half-an-hour match could be above 20 km/h, so this is also data we should have into account when designing our exercises or tasks. And we should also take into account relative data for high speed running, that is, distances faster than 18 km/h, which could be around 3 m/min.

Now we will deal with directed orientation in level 2 and 3. The proposal we make is about a work that would develop the anaerobic resistance phase with the short hiit, trying to have an incidence on the anaerobic glycolysis with 15-to-40-seconds works to the maximum, with a density of one for work and three-to-six for pause.

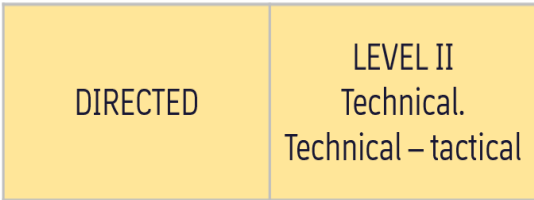
Another option to develop anaerobic resistance by HIIT, a very short one in this case with the physiological goal of phosphagen depletion will include a 2-to-five-seconds work with all-out maximum intensity and with a five-to-10 intensity for pause.



Figure 6: Level 2 task for conditional structure optimization (anaerobic glycolysis)



ANAEROBIC
 SHORT HIIT
 ANAEROBIC GLYCOLYSIS
 15-40" *all-out* 1:3-6
 4*5 de 15" con 45" pause between repetitions and 3' 30" between series



ANAEROBIC
 VERY SHORT HIIT
 PHOSPHAGEN DEPELETION
 2-5" *all-out* 1:5-10 2* (15 of 3" with 15"
 pause y 3' 30" series)

Source: Own creation.

All the exercises we are referring to are focused on the coordinative structure and on the conditional and bioenergetic structure, but they also have a clear goal, at the synergy interthematic level, in the development of the coordinative and cognitive structure. That is, in this case what we are trying to cause is that under maximum demand situations, such as coming off a screen at maximum speed and when an opponent is chasing a partner, our player, our basketball sports human beings could receive the ball, throw it with the best possible efficiency. Then you can see how different structures interact in order to optimize performance. If, on the other hand, our tasks orientation is directed to force and if we take positioning data into account, we should prepare for supporting an average of 223 accelerations faster than 2 m/s² and being able to prepare our players even for 290 accelerations faster than 2 m/s².



Figure 7: Tasks oriented to speed and force

| Orientation speed | Orientation force |
|---|---|
| <ul style="list-style-type: none">• Prepare for supporting an average of 210 meters HSR (High Speed Running)[until 300 meters]• Average HSR more than 18 km/h [until 25] | <ul style="list-style-type: none">• Prepare for supporting an average of 223 acc>2 m/s² [until 290]• 3 acc/dec/min > 2 m/s² until 5 acc/dec/min > 2 m/s² |

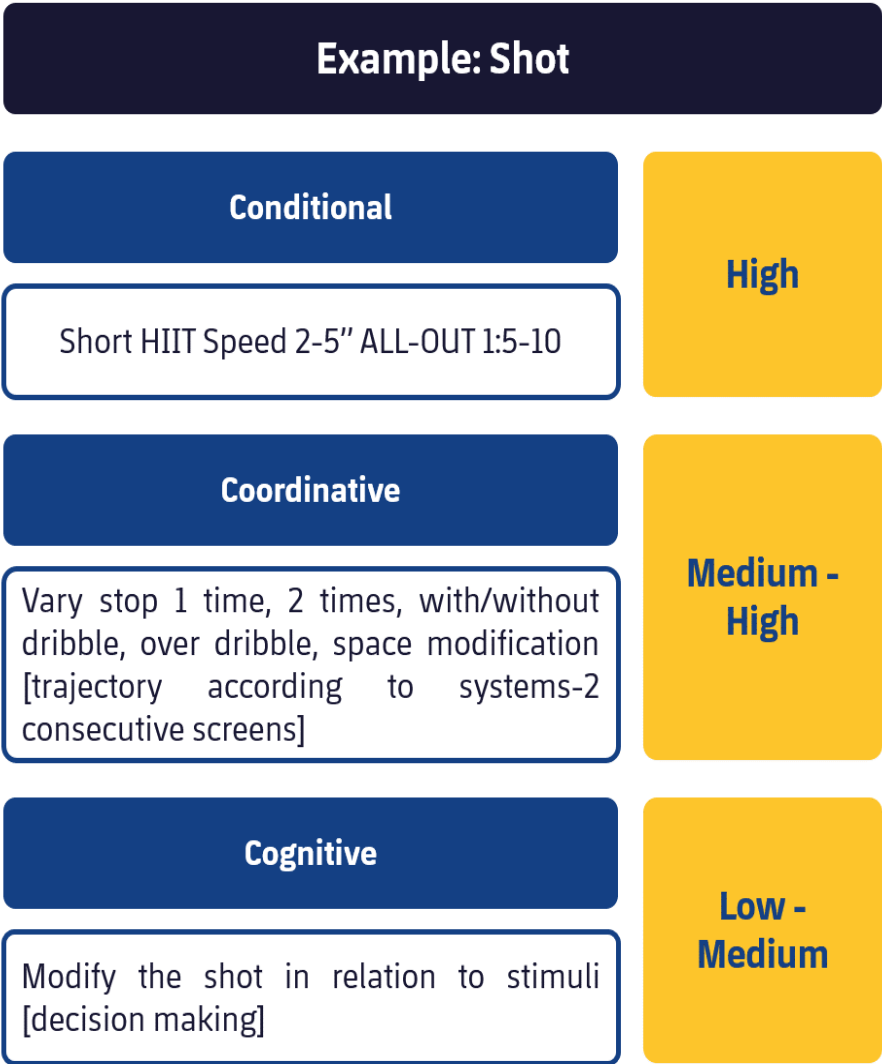
Source: Own creation.

How can we propose tasks in order to have an incidence on basket shots work? This way, for example, we would plan the task mainly relying on the development of different structures that are part of sports human beings. In relation to the conditional structure, in this example, we would use a short HIIT with consequent brief periods and a force work and, as it is brief, orientation will be at 2-to-5-seconds speed, with maximum demand and with a 1:5 density. The incidence of this structure will be high within the form of interaction between structures at the coordinative level. Its implication will also be medium-high, since basket shot work requires an important coordinative ability that we are going to try, modifying the different repetitions that would be established in those 2-to-5-seconds works, the stop, in one time or in two, receiving from one side or the other, with or without dribble before the shot, modifying space, that is, the path before receiving the ball would be different. At the cognitive level, what we would do is to modify shot in relation to stimuli that would allow simple small decision making, that is, for example, when shooting, having another player who would be able to raise hands or not to indicate that we should perform one or two more dribbles to improve the situation and be able to shoot. In this aspect, the requirement will be low-medium for the cognitive structure, since decision making will be simple in any case. At the social-affective level, the interaction with a couple, for example, would be good to develop the task, with which we would be at a low social-affective demand level. At the emotional-volitional level, we can put players to compete against each other in a couple, but we can also make them compete against the rest of the couples. At that moment, athletes are competing against the rest of the couples, competing against their partner, but, at the same time, they are cooperating with their partner against the rest of the couples. Then, the emotional-volitional structure would be reflected in a low-medium way. The bioenergetic structure would be highly required by the incidence influence in using phosphagens and the creative-expressive structure would be lowly reflected in this kind of equalizer modulation for different structures. This is just an example on how to work



the shot, not only thinking about repeating 20, 30 or 50 shots. That variety, that relation between all systems, can appear inside each of the structures, which allow for self-optimization and self-organization for the human being when performing the shot.

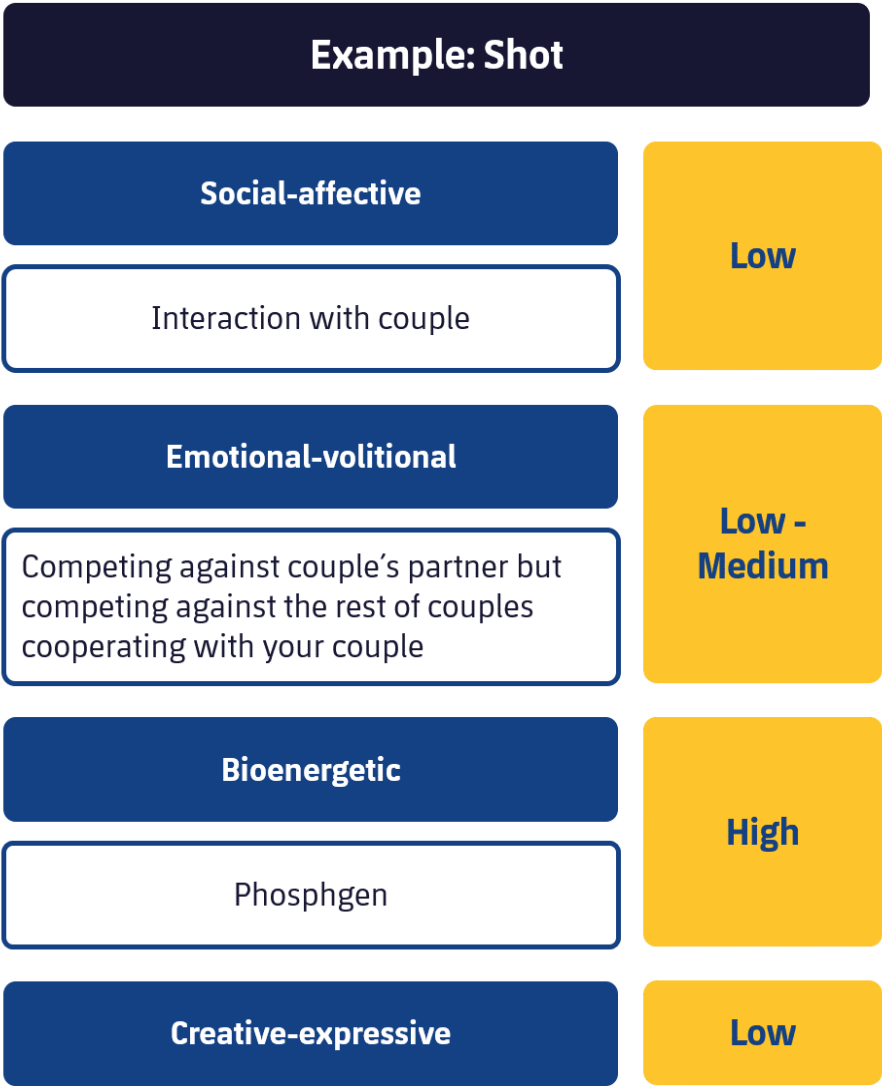
Figure 8: Optimization proposal for different structures in relation to basket shot A



Source: own creation.



Figure 9: Optimization proposal for different structures in relation to basket shot B



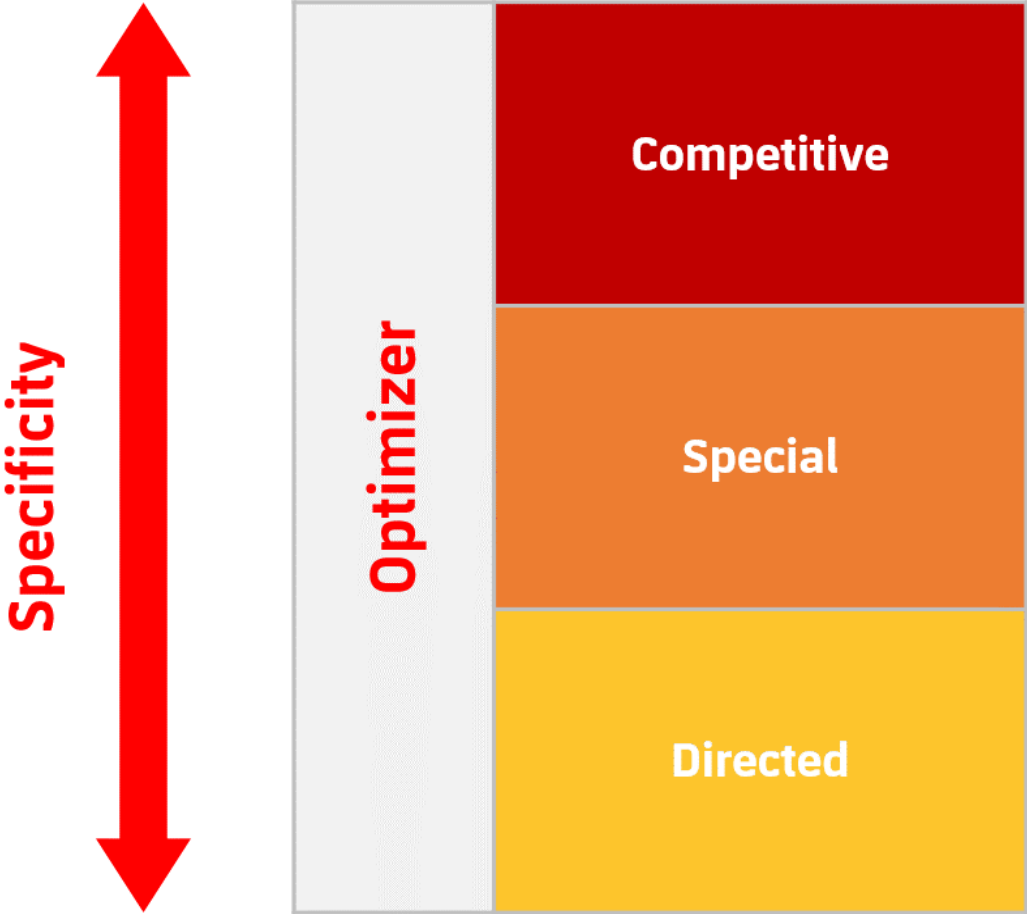
Source: own creation.

An aspect we should clearly understand is that players should perform the best at the level 10, that is, at the competition that requires five against five in official matches, not in the level zero, oriented or non-oriented zero, in the level 1 or 2 or 3; they are just means. That is, training sessions inside these levels are just means to improve the level 10, not a goal in itself. This is a point we should be very clear about, since it conditions all of the proposals que might make.

Well, once we analyzed coadjuvant-optimizer training (since directed training happens together with them both), we can move on. Below we will find orientations called the special and the competitive, with their different approximation levels.



Figure 10: Optimizer training orientation



Source: Own creation.

Then, just as we expressed before, we will not devote time to directed orientation explanation, which would also be part of this, since it is between the coadjuvant training and the optimizer training, and we will move on to special training. Special training is formed by a first level, which is level 4 and it includes reduced games, devoted specially to superiorities and inferiorities (2on1, 3on1, 3on2, 4on1, 4on2, 4on3). In relation to level 5, it would include reduced games with equal number of players. Just as level 4, decision making is complex and specific (1on1, 2on2, 3on3), emphasizing mainly in working on concepts that involve decision making such as direct screens, indirect screens or hand off.



Figure 11: Coadjuvant/optimizer training

| | | | |
|-------------------------------|-----------------|--|---|
| Coadjuvant / optimizer | SPECIAL | LEVEL V Reduced games Equal numbers | Complex and specific decision making. 1on1, 2on2, 3on3. Emphasize concepts (DS, IS, handoff) |
| | | LEVEL IV Reduced games Superiorities- inferiorities | Complex and specific decision making 2onX, 3onX, 4onX |
| | DIRECTED | LEVEL III Tactical – technical | Exercises without opposition or with passive opposition (3on0, 4on0 and 5on0). Simple and specific decision making |
| | | LEVEL II Technical. Technical - tactical | Exercises without opposition or with passive opposition (1on0 and 2on0). Simple and specific decision making |

Source: Own creation.

This special orientation includes reduced games, which are a way that allow us to optimize basketball sports human beings, since we can include different structures, prioritizing some of them, not only especially at the cognitive level, but also giving space to relevant structures like the coordinative and the conditional and others like the social-affective.

An example we could include is the development of the three-against-three full court and, specifically, an example proposal of four series of two minutes and a half, with a pause that will be established in relation to the intensity que want to give to the work. In these series, if we also want intensity to be stronger, when there were offenses, there would not be free throws, pauses or long pauses for any technical-tactical explanation.

We are going to focus in finishing the enumeration of ways to modify reduced games' conditions (special level's preferential simulating situations). We can reduce the number of players that in a same-court-size situation will increase their physiological demand.



Figure 12: Special orientation Reduced games

SPECIAL

| | | |
|---------|---|---|
| SPECIAL | LEVEL V Reduced games. Equal numbers | Complex and specific decision making 1on1, 2on2, 3on3. Emphasize concepts (DS, IS, handoff) |
| | LEVEL IV Reduced games. Superiorities- inferiorities | Complex and specific decision making 2onX, 3onX, 4onX |

REDUCED GAMES are a way to improve players’ capacities (technical, tactical, conditional)

3on3 FULL COURT 4*2’30” PAUSE? WITHOUT FREE SHOTS NOR LONG PAUSES

Source: Own creation.

The one against one or two, three against three on full court could be considered as a training tool more reliable when the aerobic and anaerobic systems are required above the real five-against-five game conditions. Another aspect to modify would be the relations between work and rest time, that is, density.

When designing training exercises it is important to know about basketball characteristics, since it is the point of departure, just as we have expressed before. In relation to that, we should propose exercises that are above a certain physical demand level, at the same level or below it, in relation to the real game conditions.

If the measure unit is X, we can manipulate the ratio relations between exercise series through players’ rotations, among the players that are on court and resting, and during task performance periods. Not only modifying rules, but also reducing or increasing stop periods, out of bounds, baseline, free throws, etc. Court dimensions, just as we said, are another way to modify reduced games in the special level. With an equal number of



players, increasing the court size will increase physiological demands on half court, for example, versus one, two or three courts in a continuum.

However, a smaller game space implies that there are significantly more technical action frequencies typical in basketball. Then, a simple way of quantifying the conditional structure could be by establishing the number of courts (half court, half court plus one transition plus two).

And the last aspect to point out is trainer's motivation. This effect could be important from the practical point of view because the motivation given by the trainer has proven success in achieving bigger physiological demands.

In relation to highlighted points, a high intensity exercise could be games of two-against-one, three-against-two on full court with trainer stimulation. And another option could be to limit the number of dribbles or possession time, which could be, as we have expressed, useful tools for increasing physiological intensity and also for increasing the number of the different technical actions we want to carry out.

Well, we have gotten to the point where we will deal with competitive orientation. Competitive orientation is composed by levels 6, 7, 8, 9 and 10.

This way, level 6 includes four-against-four or five-against-five exercises on half court or one court maximum. Evidently, there is a collective tactic work in which there is no role change, that is, there is no transition from defense to attack.

Level 7 includes complex and specific decision making, same as the previous one, and it includes four-against-four and five-against-five works on more than one court (there must be at least one transition), emphasizing also some concepts like direct or indirect screen, hand off, same as before.

Level 8 includes a real match simulation, but in a training session.

Level 9 includes a real match simulation, but with friendly match conditions.

And level 10 will be the official match.



Figure 13: Competitive orientation

| | | |
|--------------------|--|--|
| COMPETITIVE | LEVEL X Official match | Complex and specific decision making 5on5. Emphasize concepts (DS, IS, handoff) |
| | LEVEL IX Friendly match | Complex and specific decision making 5on5. Emphasize concepts (DS, IS, handoff) |
| | LEVEL VIII Real match simulation | Complex and specific decision making 5on5. Emphasize concepts (DS, IS, handoff) |
| | LEVEL VII Reduced games (1/2 court + 1 court or more) | Complex and specific decision making 4on4 5on5. Emphasize concepts (DS, IS, handoff) |
| | LEVEL VI Reduced games (1/2 court o 1) | Complex and specific decision making 4on4 5on5. Collective tactic. No transition |

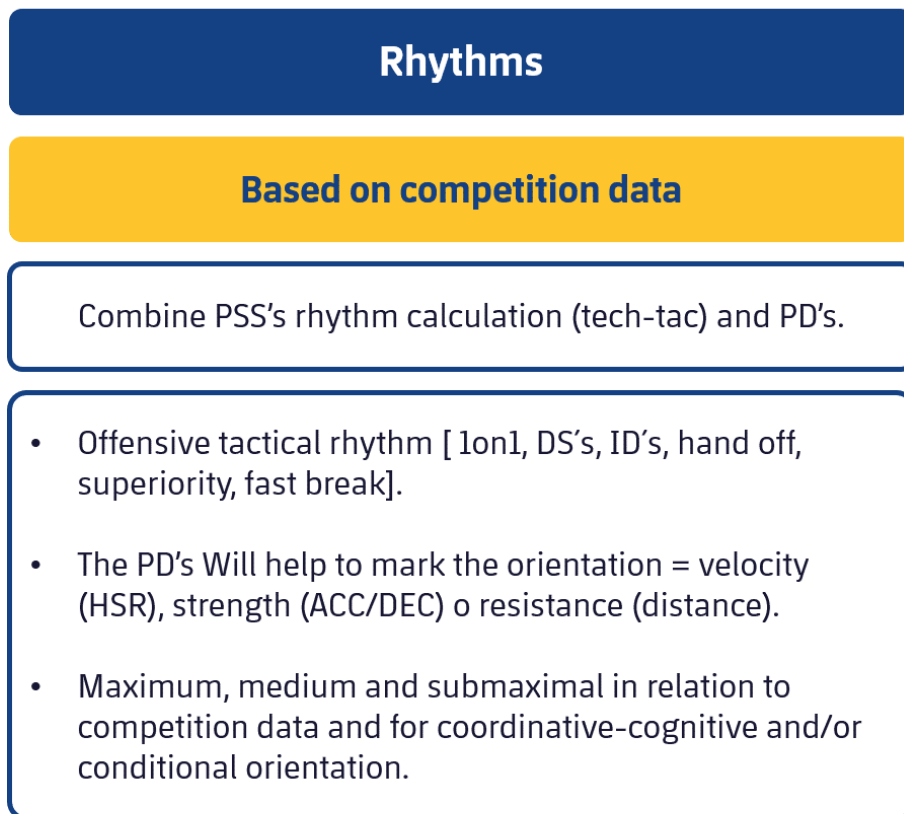
Source: Own creation.

At this stage, an example could be performing four series of three minutes and with a pause that will be determined by a certain density, which, in turn, will be established in relation to the goals que want to achieve, relying mainly on conditional, bioenergetic and emotional-volitional structures.

By the way, it is important to mention that we need to recover the concept we have already mentioned: the concept of rhythms. Rhythms must be estimated taking competition data into account. That is, we should establish rhythms, not only the technical-tactical one but also the conditional rhythm, which will be given, in this case, by variables, by physical demands and/or by internal demands like heart rate in performed tasks.



Figure 14: Rhythms



Source: Own creation

This way we should combine preferential simulating situations estimating both rhythms. These rhythms are categorized as maximum rhythms if they are above the average, as medium and sub-maximal rhythms in relation to data we have obtained in competition. All of them are mainly based on an orientation whose base are the coordinative, the cognitive and the conditional structures.

Physical demands will help to indicate whether the orientation inside the conditional structure is focalized on speed capacity, on force capacity or on resistance. The first one will be given by high intensity speed (faster than 18 kilometers per hour). Force will be given by the accelerations that are faster than two meters/seconds and resistance by the total covered distance.

We should remember that game rhythm is what has more to do with coordinative and tactical structures and it is estimated in the following way: Each possession is defined by the number of technical-tactical, individual and collective actions during a certain time. That way we can see rhythm: a number of actions performed during a certain time.

Possession rhythm then will be the quotient between the number of actions we have performed and the time. As an example, an A possession which has four actions and has

been measured in eight seconds will have a rhythm of 0.5. That way, the offensive rhythm average is the sum of each possessions' rhythm, dividing it by the total of possessions. We could do the same estimation with the defensive rhythm.

Until now, in order to establish references, mainly in relation to physical demands our high-level basketball athletes have to support, we have been dealing with measures. For example, in preseason period we had to prepare athletes to reach 300 meters at more than 18 kilometers per hour, with a total of until 30 actions.

That is why we are talking about match averages and we can also talk about relative averages in relation to minutes, which could help us in a match to reach, just as we have said, 3 or 5 meters per minute faster than 18 kilometers per hour.

Anyway, a new approach, the one we already know for maximum demands scenarios, has taken us to establish which those new maximum demand scenarios are. In order to prepare our players with better efficiency to support physical demands seen on this new approach we need to pay attention to this. This new approach is based on traditional views on averages.

Then, in a basketball match we could exceed the average distance of 65 and 75 meters per minute.

We could make a maximum demand scenario to be around 135 meters per minute, which is practically the double of the average.

In relation to high intensity distances we could exceed those three or five meters per minute average in a match. We should prepare athletes; generate preferential simulating situations in which players reach until 30 meters per minute at a speed of 18 kilometers per hour.

In relation to accelerations distance, bigger than 2 m/s^2 , we should prepare our players for reaching 54 meters distance per minute and 44 meters distance, bigger than 2 m/s^2 , in decelerations. If we make references to these same components, but in this case 3 m/s^2 , we would be talking about an acceleration of 30 meters and 29 meters for deceleration.

And lastly, to give other data, we will be talking about the variable of High Metabolic Load and we should prepare our players to support 48 meters per minute.

