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**PSYCHOLOGICAL INTERVENTION IN TABLE TENNIS: SKILLS ASSESSMENT AND ENHANCEMENT IN TALENTED-YOUNG PLAYERS**

**Abstract**

*Sport performance is the result of the control and integration of the athlete's physical, technical, tactical, strategic and psychological skills and capabilities. In order to obtain a great level of control on these competences, a large amount of time and effort is destined to the athlete's formation process. The individualized identification of the players' specific needs, deficits and resources, and of their level of control in the use of skills will help in the formulation of the intervention objectives and in the design of the psychological training. The main aim of the psychological training is to develop the mental competences which are considered as relevant for each athlete, considering his/her needs, the sport modality, his/her level of knowledge, expertise, experiences and self-control, and the level of competition. Nonetheless, to approach this goal, it is necessary to previously perform an exhaustive assessment of their competences, capabilities and skills, with the aim of providing them with a psychological training, which results appropriate to their resources and needs, to enhance the athletes' sport preparation and to optimize performance in training and competition.*

*Inserted in the National Sport Technification Program developed by the Spanish Royal Tennis Table Federation, it has been included a psychological intervention aimed to the detection of the psychological skills of tennis table young players and to the enhancement of the personal control on these by the athletes who are participating in the above-mentioned program. This work is in accordance with the program general objective of identification, selection and formation of talented young players. This work is integrated along with the work developed in the remaining program areas, and it is adapted to the characteristics, resources and needs of the participants.*

*The specific goals, characteristics, structure, components and main results of the developed psychological intervention are presented in this paper. Results have indicated the suitability of considering psychological assessment and training for the complete preparation of players in order to improve psychological skills which allow them to confront adequately the increasing demands of sport participation as their implication advances. This is highly relevant in the case of individual and collective sports modalities, as well as in the identification and formation of talents, specifically in racket sports, and table tennis particularly.*

**Keywords:** *Psychological assessment, psychological intervention, table tennis, youth sport, talented players.*

**1. Introduction**

Table tennis is a young and minority sport in Spain. Nevertheless, this athletic modality is chosen by non few people for both recreational and competitive practice. This has contributed to the growing acceptance and practice of table tennis in our country.

In Spain, the Royal Table Tennis Federation has registered about 200 athletes in the National Sport Technification Program (NSTP) in all young categories. These athletes

usually are trained in their local clubs with other players, but these selected ones attend NSTP national or regional concentrations in Technification and Sports Specialization Centers to optimize their formation. These concentrations occur several times a year and have duration of 4-5 days. Generally, the National Selection is formed by some of these selected athletes.

The conditions of the NSTP involve working with athletes throughout a few occasional contacts along the season and during a brief period of time. Nonetheless, during these concentrations a large, comprehensive intervention is provided to the athlete. Psychological training is also offered. Some of these selected players maintain a continuous contact with NSTP techniques.

We present in this paper the rationale, objectives, structure and main results of the psychological intervention we develop as a part of the preparation process offered by the NSTP for table tennis players. We offer in first sections a brief presentation of core issues on psychological training in (youth) sport. In subsequent sections, we present our psychological intervention in the NSTP for table tennis players and main results derived from it.

## **2. The psychological intervention in sport**

Sport performance is resultant from the control and integration of the athlete's physical, technical, tactical, strategic and psychological skills and capabilities. In order to obtain an appropriate level of control on these competences, a large amount of time and effort is destined to the athlete's formation process, in pursuit of the learning and consolidation of the specific competencies of the concrete athletic modality. The ultimate objective of this formative program is to increase the athletes' opportunities of success, so that they can obtain the better results as possible in their competitions.

It is not unusual to hear a player to complain that "he/she is very nervous before a championship match", "he/she is unable to maintain himself/herself concentrated during the whole match", "he/she collapses after a series of failures", "he/she is not as motivated for training sessions as for matches" or "he/she is not experiencing the expected comradeship with his/her companions". Usually, complaints are referred to what the athlete is experiencing before or during matches. Sometimes, complaints are not referred to what happens to him/her during matches, but in trainings. Sometimes, complaints are referred to relationships with pairs, coaches or even parents. Sometimes, complaints are related to other life-domains, as when the player mentions the incompatibilities between sport dedication and school or friends demands.

All these situations reflect an important group of skills the athletes need to control adequately in order to achieve a successful participation in terms of athletic outcomes. Furthermore, these skills are also necessary to obtain the benefits supposed to be derived from healthy, proper, enjoyable and educational sport participation. As Weinberg & Gould (2007) have pointed out, both athletes and coaches recognize that sport success is *mental* in at least a 50 percent, and for some modalities in a 95 percent. These mental skills make the difference between the "good" athletes and the "best" ones (in equal conditions, of course), or explain why an athlete varies their performance between two consecutive days. Peak performance that above ordinary performance can only be achieved by unifying and integrating all athletes' capabilities. Peak performance is obtained when the athlete does his best both in physical and in mental domains (Williams, 2001).

Sport Psychology is the branch of Psychology (or of Sport Science, depending on the author) that provides answers to relevant questions about human behavior in the domain of sport (Gill, 2000). The skills we are talking about are some kind of behavior and, as behaviors, are modulated by the personal as well as the contextual factors which we psychologists know influence behavior. And, as behaviors, they are subjected to the same principles of explanation, prediction and control of behavior, which psychologists also know well. The immediate implication is obvious: These behaviors, as occurs in the case of whatever other sport skill, can be learned and managed. Furthermore, athletes

can be trained for self-regulation in order to make, beyond their control, their peak performances more feasible and recurrent.

Background and tools of Psychology, and concretely of Sport Psychology, help the athletes and coaches (and the remaining people in sport arena) to self-manage successfully their psychological resources, processes and states. As Buceta (1998) has stated, the specialized knowledge of Psychology on behavior, and its methodology for assessing, understanding, explaining and modifying it can be of a great utility in increasing sport performance. In doing it, Sport Psychology considers the psychological functioning of the athlete, along with the physical, technical or strategically functioning, a central element for performance and success.

Hence, psychological training is a core ingredient of the recipe in which physical, technical and tactical enhancement are added to obtain the best (possible) from the athlete. Psychological intervention includes the *training of mental skills* which are relevant for achievement and performance both in training and competition, as well as in resting and recovering periods.

Psychological intervention in sport is aimed to train the individual to generate an ideal mental state at will. This state of maximum psychological performance has been called optimal mental state (Orlick, 2000), individual zone of optimal functioning (Hanin, 1995), psychological momentum (Cornelius, Silva, Conroy & Petersen, 1997; Taylor & Demick, 1994; Vallerand, Colavecchio & Pelletier, 1988) or flow state (Csikszentmihalyi, 1991; Jackson & Csikszentmihalyi, 1999), although the vast majority of authors just call it psychological peak, ideal or optimal state or functioning. Whatever the name used, this ideal state is a complex multivariate recipe of cognitions, emotions and physiological parameters that lead to peak performance (Gould & Udry, 1994). Psychological peak state is likely to mediate performance via cognitive and affective processes (i.e., optimism, sense of control, motivation, self-efficacy, concentration, enjoyment, energy and synchronization) as well as physiological factors (i.e. physiological arousal). In this state, psychological variables which are relevant for learning or performance are leveled to their optimal set point (or range, better).

The main goal of psychological training is to provide the athlete with a set of tools, which autonomous control and adapted to demands execution allows him/her to self-manage his/her psychological resources (Chen & Singer, 1992) and, also, other nature ones, and to obtain the maximum of him/herself in trainings, competitions or restrings/break periods. Hence, psychological intervention hunts for the complete preparation of the athlete and the enhancement of his/her integral functioning.

In order to obtain this goal, psychological intervention needs to assess athlete's resources, then to facilitate the learning, practice and consolidation of required skills, uniquely customised to their sport, context, task and personal factors, and, finally, to create with the player and to automatise action plans or routines. These routines are aimed to organize his/her behavior, for the use of and by using the learned skills before, during and after training sessions or competitions.

Psychological preparation must be integrated with physical, technical or tactical preparation. Psychological training would help the learning and consolidating processes relative to sport skills (physical, technical or tactic skills), would help the athlete to tolerate the loads and demands of training for a better adjustment, to increase his perceptions of control and self-confidence, to promote his well-being, to eliminate the obstacles that interferes with his performance, and to enhance his performance in trainings and competitions. Psychological training should be integrated also in the psychological planning of the season, which includes the psychological planning of training sessions, competitions and recovering phases.

An important variable is the age of athletes. It has been argued that mental training is beneficial for athletes with any level of experience, capability, expertise or age. But if the complete, integrated preparation of the athlete, including psychological intervention, is implemented early in his sport trajectory, it could be guaranteed the consolidation of a proper base which allows him to confront successfully the diverse sport situations, and which will facilitate the conquest of a potential of peak performance and the obtention of the benefits of the practice (Williams, 2001).

At this early moment, to instruct the athletes to establish realistic but ambitious goals, to maintain the concentration focused in relevant factors, to increase their self-confidence, to visualize successful performances, to manage the activation levels, to react constructively to failures, or to deal with the stress of competition, amongst other skills, will help them for a faster and more adequate athletic as well as personal development and achievement.

On the other hand, it has been pointed out consistently in the psychological literature that it is easier to develop positive competencies -through effective training practices- when people have not previously learned and consolidated opposite behaviors, which may be neutral or even harmful. When the person has learned a damaging habit, in changing it it is necessary before to eliminate the consolidated one, and then to establish the new desirable one. Translating this to sport arena, this means that it is easier, and more appropriate, to instruct young athletes in proper competences, instead of waiting to a later moment, in which they probably will have more installed habits. The sooner the intervention, the best expected consequences it will have.

It is important to indicate at this point that psychological intervention does always follow an educational and edifying goal. It also occurs in sport arena, and it is especially important in youth sport. As authors like Weiss (1991, 1995), Smith & Smoll (2003), Danish et al. (2003) or Balagué (1993) emphasized, young athletes may be strongly enriched if they are trained in skills and competences which are useful in their sport participation but also in their daily life. Sport may constitute an appropriate context for a positive, developmental improvement of resources for life in children. The control of psychological skills learned in sport may generalize to other life-domains, and athletes can use these self-regulation skills in other everyday situations, such as school or social contexts. Furthermore, these skills for life and sport are precisely what is needed for optimal enjoyment, well-being and performance in competitive sport. In words of Vealey (1988), the educative, developmental model in which psychological training is sustained focuses the attention in rise and change to help people to obtain a greater control in their life's and a better coping with demands abilities, both inside and outside the athletic domain.

Finally, the ultimate goal of psychological intervention is to promote the health and well-being of individuals. And this is also applicable to sport domain. Athletic success should not be getting at any cost, and psychological intervention should only be offered under this perspective.

Considering the points mentioned above, an ultimate consideration should be made. It could seem that psychological intervention should be available only when athlete show any skill-deficit, concern or problem and, as a consequence, a low performance. But, on the contrary, this condition is not necessary for considering interesting or suitable the psychological intervention, since the goal may be, not to correct deficits, but to improve resources. Psychological training may be destined to promote the current control on skills and the self-regulation abilities.

### **3. Core elements and phases in the psychological intervention planning, programming, implementation and evaluation**

Sport psychology service delivery is a complex process, and no formula can be provided for an effective intervention for all athletes in all situations. However, some aspects should be addressed for an adequate service. Psychological intervention should be completely planned and organized before its implementation if it is pretended to be appropriate and effective. Hence, objectives, tools, methods, possible outcomes or coping with results strategies should be considered for each of the phases of the process (before, during and after the intervention, each with its concrete sub phases).

The planning of the intervention refers to the programming of the methodology which is going to be used for assessment, goal-setting, strategies and tools selection, resources consideration, implementation of the intervention and outcomes evaluation. It

is the organization of contents and ways of implementation of the intervention in the most proper manner, so it will be as effective and useful as possible (Olmedilla, 2002).

The next proposal is based on psychological applications on several areas, on several papers published in the sport area and specifically in table tennis sport (Marí, 1997), and on main reference manuals on Sport Psychology, some of which also include psychological work with young athletes (Buceta, 1998, 2004; Cruz, 1997; Gill, 2000; Hardy, Jones & Gould, 2003; Van Raalte & Brewer, 2003; Weinberg & Gould, 2007; Williams, 2001). These sources include detailed information on psychological assessment and intervention in sport domains. Finally, it is also derived in a great extent from a work by Godoy-Izquierdo, Pradas & Vélez (in press), in which a planification of psychological work for a complete season aimed to table tennis players is presented. In this program, 45 sessions are proposed in which basic psychological work is offered.

It should be stressed that the psychological intervention should be integrated and coherently developed in association with the complete preparation of the athlete, considering the main goals of physical, technical and tactical preparation as well as the competitive schedule. This is why coaches should participate also in the psychological preparation, both for establishing objectives and for collaborating in the training itself. Not only the objectives of the preparation in physical, technical or strategically domains should be taken into account, but also the conditions of such delivery. Usually, psychological intervention does not receive the same consideration as the remaining preparation in terms of time (frequency of sessions, duration of sessions, long-term booster sessions...). It should be stressed also that a collaborative, active role is needed on behalf of the athlete to obtain maximal benefits from the intervention. Psychological peak performance can be achieved only with effort, commitment and dedication in learning and consolidating processes.

#### *First sessions.*

An important variable is time constraints-relationship with psychologist match. Since Petitpas, Danish & Giges (1999) emphasized that the quality of the relation established between the sport psychologist and the athletes is a core factor for positives outcomes derived from the intervention, because it is the most relevant factor for cooperation, this relationship must be established encouragingly.

It is also important to explain the athletes what a sport psychologist is, what does he/she do, what is expectable from intervention, and what is impossible to obtain after a psychological intervention. They also have to be instructed in the role of psychological variables in athletic performance, and basic information on psychological training should be also provided. This information must be given in the first sessions in order to improve knowledge and to adjust expectations of athletes regarding the psychological work.

#### *Assessment of deficits and resources and needs establishment.*

After the introduction of psychologist and psychological work, the first step of the intervention is to explore the demands, concerns or problems of athletes, if this is the case, or just to establish their current condition. The main aim of this phase is to obtain precise, realistic, complete and relevant information regarding the psychological functioning and demands of athletes. Before beginning the intervention, it is necessary to fully understand the needs and context of needs. The individualized identification of the players' specific needs, deficits and resources and of their level of control in the use of the later will help in the formulation of the intervention objectives and in the design of the psychological training to develop the mental competences which are considered relevant for each athlete considering his/her needs, the sport modality, his/her level of knowledge, expertise, previous experiences and self-control and the level of competition. Nonetheless, to approach this goal, it is necessary to previously perform an exhaustive assessment of their competences, capabilities and skills, adaptive and maladaptive patterns of thinking, feeling or behaving, both individually and collectively, with the main aim of offering them a psychological training which is appropriate to their resources and needs and which results in an enhancement of the athletes' sport preparation and in an optimization of their performance in trainings and competitions. In other words, it is

necessary to assess important variables involved in understanding and changing behavior. Several tools, such as self-reports, interviews, observation, psychophysiological registers, etc., can be used. The collected information should be completed with that given by significative others (coaches, parents, other players...). These data also should be completed with field assessment: observing athletes in real situations supplies a wealth of data on what is actually happening.

*Objectives: Individualized goals for athletes and psychologists.*

Intervention must be provided to increase resources of the athlete. Once we know what is happening, we set what is tried to be accomplished by both the sport psychologist and athletes. These objectives should be expressed both in terms of the outcomes we hope to bring about once the intervention will be finished (outcome objectives), and in terms of what the athlete should learn, use and get mastery on in getting the above-mentioned objectives (performance or process objectives). These objectives should be also established for a short-term, a medium-term and a long-term. That is, in the planning of the psychological intervention, goals to be achieved should be formulated in a sequential and progressive manner, considering the personal characteristics of each athlete, his/her concrete and changeable demands and his/her progresses. There are several issues concerning the proper characteristics of these intervention objectives to be appropriate and useful ones, but the most relevant are the followings: They must be specific and clear, and they must be defined operationally; they should include the expected positive result and the expected time in which they have to be achieved; and they should express the strategies which have to be used to achieve them and to assess the effectiveness or success in achieving them. The same could be said for psychologist self-planification.

*Plan of action: The planning of the training.*

Once goals of intervention have been defined, before beginning the training it is necessary to establish: a) the structure of such training, or, in other words, its contents in terms of the psychological skills to be trained and the strategies for training them, b) the program of sessions (number, duration, location in the general program of preparation, structure and contents of each one...), and c) temporization (from the beginning to the end of the training). It is also necessary to foresee obstacles and problems and to propose possible strategies for preventing, solving or controlling them.

A distinction should be made between psychological "skills" and psychological "methods" or strategies (Vealey, 1988). Psychological skills are referred to the competencies or characteristics (i.e. motivational self-regulation) which allow a person to behavior in a concrete way. Psychological strategies are the tools used to achieve such skills (i.e. goal-setting for motivational self-regulation). They are distinct completely. Nevertheless, the control and implementation of these strategies can be also viewed as psychological skills (Hardy et al., 2003). Those tools are what is offered to athletes, and they learn how to use them to self-manage properly the skills more appropriate for each demand.

*Psychological training.*

This phase includes properly the training in the psychological skills which have to be learned, practiced and used to generate the optimal mental state for plenum performance and for subjective well-being. These processes should be adjusted to three basic phases of learning: educative phase (what's/why psychological training?), acquisitive phase (how to learn psychological skills?), and practice phase (how to use new psychological skills in real situation?). Skills are learned throughout proper learning experiences, and Psychology also knows deeply the principles of learning and how to promote optimal learning processes. As soon as skills are learned, these must be practiced in real situations progressively more analogous to real training and competitive contexts. In this practice, action plans or routines are elaborated by the athlete with the supervision of the psychologist, and these routines are also progressively practiced in order to be automatized and completely integrated by the athlete. These routines

organize the behavior, through the application of acquired psychological skills, prior, during or after the training session or competition. In preventing problems in their application to real situations, alternative action plans should also be generated. All these processes need what Ravizza (2001) named *self-consciousness*.

#### *Final evaluation.*

Improvements in performance outcomes or other relevant objective indicators should be assessed at the end of the intervention. Nevertheless, this information will be only a small part of the changes experienced by the athlete. Hence, other objective and subjective indicators of progresses should be addressed too. Amongst them, the following are very interesting: how much the athlete has progressed in his/her level of control on psychological skills; whether he/she uses currently acquired psychological skills correctly in terms of context demands, procedure or effort; whether these psychological skills are being generalized to other domains; or whether athletes and coaches are satisfied with information, interaction and instruction offered. Answers to these questions will establish the quality and effectiveness of the intervention, and may help the psychologist to adjust intervention principles for future applications.

Furthermore, once gains have been reached, it is necessary to establish new goals or to initiate the termination of the intervention. Boost or foster sessions may be required to consolidate changes.

#### *Continuous monitoring.*

The psychological intervention, as occurs with the remaining areas of preparation, is not a lineal process with only forward advances. Failures in achieving goals may be constantly present, and failures not only should be analyzed, but they also must be used for further efforts to find a solution. Other unexpected events may change initial planning, as injuries, illnesses, competitive new schedules, competitive outcomes, new goals in other domains of preparation... Besides, implementation of the psychological intervention should be monitored. A continuous monitoring of progresses and obstacles will allow the expert to perform the proper corrections in the programmed intervention in order to adjust it to the current conditions of athletes. It also will help him or her to establish the degree in which initial goals are being reached in different moments of the intervention. A *diary* or a daily record by the athletes detailing psychological skills used, contexts of applications, effectiveness, obstacles, etc. will help the athlete and the psychologist to monitorize progresses.

## **4. Psychological intervention in the NSTP-Table Tennis Program**

As has been mentioned earlier, inserted in the NSTP general objective of detection, selection and formation of talented young table tennis players, a psychological intervention has been included aimed to the detection of the psychological skills of athletes who are participating in such program and to the enhancement of players' self-regulation skills. This work is integrated along with the work developed in the remaining program areas, and it is adapted to the characteristics, resources and needs of the participants.

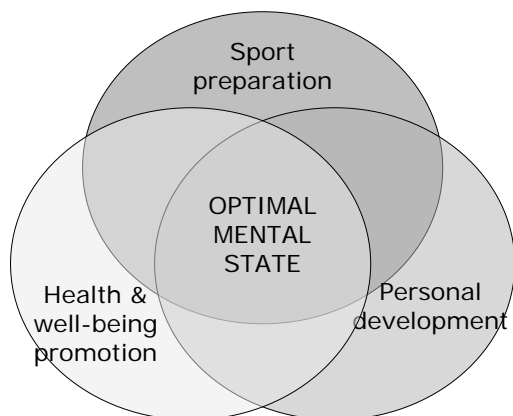
We detail in this section our work for psychological skills assessment and enhancement in selected, talented young players of table tennis in the NSTP. This is a general presentation of the administered intervention and counseling, which is actually appropriately adapted to specific athletes' circumstances and demands.

As we have stated previously, psychological intervention is sustained in the establishment of psychological variables which may exert a positive or negative effect in learning and performance both in training or competitions. The goal is to detect the psychological optimal state for each situation and to modify psychological variables for peak performance and optimal well-being of the athlete (Buceta, 1988).

This means we aim to train the athlete in a series of psychological skills which allow him/her to appraisal relevant information in sport situations, to know the status of

his/her psychological states and processes, to self-manage these states and processes taken into account set goals, to compare diverse action alternatives and to choose and execute the appropriate courses of action suited to each circumstance, to evaluate the decisions adopted and their outcomes and, finally, to learn of such decisions and outcomes.

As an ultimate goal of NSTP- Psychological intervention area, we pretend selected athletes to learn and to self-regulate conveniently a set of psychological skills which will increase their successful actuations in terms of execution and outcomes, in whichever circumstance of trainings, competition or recovering periods. Nevertheless, we do not pretend only to optimize their sport development and performance, but also their personal development and achievement. Hence, generalization to other domains of learned self-regulation is also pursued. Finally, a contribution to the promotion of satisfaction, health and well-being of athletes is also searched for. Figure 1 shows these ultimate goals of NSTP-Psychological intervention.

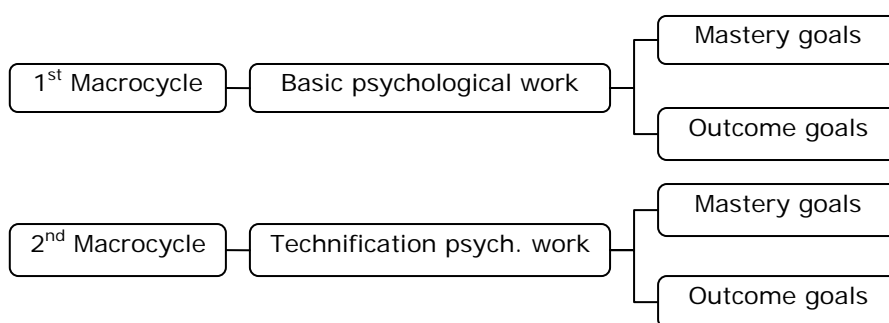


**Figure 1** Main core goals of NSTP-Psychological intervention.

Optimal mental state is crucial for human behavior and well-being.

These ultimate's goals are detached in several short-term, specific, individualized goals. These objectives are referred to the desired changes each athlete should reach, and they establish both the level of self-control on psychological skills which is pretended to be achieved in each moment in season (mastery goals), and the performance outcomes set for each moment in season (outcome goals). This is the reason why objectives must be defined considering season structure, competition schedule and a period in which season is divided.

Season structure is divided in two macro cycles (from August to February, and from March to July), with several sub cycles which have to be considered in psychological work programming as well. Basically, during the first macro cycle, we use to perform a *basic work* for psychological preparation in which relevant psychological skills are trained and practiced in progressively more relevant competitions. During the second macro cycle, a *technification work* is performed, in which learned skills are perfected and applied, along with other relevant, complex skills which are trained, to more important competitions. Figure 2 shows the scheme of psychological work and its objectives in each macro cycle. In both basic and technification work, main goals are the assessment of psychological skills and the training of psychological skills which are relevant to sport, but attention to other needs outside the athletic area is also provided.



**Figure 2** Main goals of psychological intervention in macro cycles.

Main objectives are detached in progressively more specific goals.

Main mastery objectives of both macro cycles are the following:

#### First Macro cycle Objectives:

- Relevant psychological skills individualized training, learning and practice.
- Learning of self-monitorization of mental status and processes.
- Learning of objective appraisals of circumstances and of resources for dealing with them.
- Early use of psychological resources suited to context demands for self-regulation of psychological variables.
- Pre-elaboration of routines.
- Progressive preparation of the athlete for the competition schedule demands.
- Promotion of physical and mental well-being.
- Promotion of sport and personal development.

#### Second Macro cycle Objectives

- Technification of learned psychological skills.
- Learning and practice of new complex skills.
- Precompetition, competition and postcompetition routines definitive generation and progressive practice.
- Alternative routines generation and practice.
- Extend athletes' knowledge on psychological and contextual factors of influence in performance and on self-regulation skills application.
- Promotion of adjustment to increasing demands of season and promotion of recovering.
- Learning generalization.
- Promotion of physical and mental well-being.
- Promotion of sport and personal development.

We now describe in the following sections psychological work in each of the macro cycles.

#### *Basic psychological work.*

Following the background detailed above, we begin psychological intervention with an introduction of psychological work. As we have just commented on, a necessary collaboration relationship should be established between athletes, coaches and psychologist in order to create the propitious climate for intervention and desired outcomes derivation. The first sessions are destined to create this climate and collaborative roles. Plays, a friendly, comfortable emotional climate and the figure of psychologist as part of coach-team –and not a foreign specialist- help in the establishment of the desirable relationship with athletes.

The first sessions are destined also to the instruction on why psychological training is relevant and what psychological training is itself. This includes providing the athletes with a complete background on psychological skills, on the relevant role of psychological variables in sport performance and on the suitability of a psychological training in sport domain. Main objectives of psychological work (see figure 1) are also presented and discussed with them, and realistic expectations are created. We use to use some plays and debates in presenting this information. For example, collective debates in which athletes reflect on psychological factors implicated in previous successful and non-successful performances are a proper tool for introducing the psychological intervention.

Once bases of psychological work have been well-established, we proceed with the identification of both strengths and weaknesses of players. A detailed assessment is performed in which information is acquired from athletes and coaches basically, although if it is required to implicate other relevant persons, such as parents, they are also included in the evaluation process. Tools we use for the assessment of objective and subjective parameters are varied: field-observation of performance and of use of skills (depending on the variable, when it is possible), self-reports, such as questionnaires or self-registers, interviews with athletes and coaches, or other required measures. As an example of concrete instruments we use, some of the authors created some time ago the «Psychological Skills and Behaviors in Competitive Sport Questionnaire» (CHPCDC; Godoy-Izquierdo, Vélez, Ramírez y Andréu, 2001, 2006), which is a questionnaire which assesses 20 psychological variables and allows the athlete to indicate also expectations and objectives regarding a possible psychological enhancement program for peak performance. Its version for young athletes has been found to be reliable, valid and practicable in athletes from very early ages (8 years old and older). For older athletes (18 years and above) we use the adult version. We found the information provided by this questionnaire very useful in determining both baseline levels of control on psychological skills and progressive or final levels of mastery. Based in this tool, we also have elaborated a semi-structured interview which can be used as a complement of the questionnaire. Hence, responses to the CHPCDC can be deeply completed by interviewing the athlete with that interview version.

Once the assessment process has finished, the complete obtained data is integrated and individual and collective mastery and outcome goals are proposed by psychologist and coaches. These goals are then presented to athletes and discussed with them in order to increase their motivation and adherence to psychological intervention. When athletes are invited to participate in these decision-making processes, they usually gain in commitment. In this cooperative discussion, athletes are invited to manifest their concerns, needs or personal goals, in order to include them in the intervention goal-setting.

Once individual and collective goals are set, the initial planning and programming of psychological work is revised. The sport psychologist now adjusts his or her initial plan to new information, and a psychological intervention is formulated which is completely adapted to resources, demands and circumstances.

In this first macro cycle, only *basic* psychological work is offered. Hence, only basic psychological skills are trained. These basic psychological resources are in themselves relevant mental strengths, but they are not the only ones relevant for sport performance. Furthermore, they are destined also to be in later phases the bases of more complex psychological skills. Basic trained skills are usually:

- basic motivational self-regulation: sport, daily and competitive motivation self-regulation, goal-setting skills, decision-making abilities and problem-solving abilities.
- control of self-talk: positive thinking, self-instructions and attributions.
- self-confidence: self-efficacy and perceptions of control and mastery.
- imagery and mental rehearsal use
- activation control
- attentional/concentration self-management

With the exception of self-confidence and attentional control, which are considered as complex skills, the remaining have been considered as the four psychological basic skills for sport (Hardy et al., 2003). Nevertheless, we consider self-confidence to be pivotal for

sport (and human) behavior, and its training is included early in psychological work. The same is applicable to attentional control, which also is a core leg of sport (and human) performance.

Independently of the athletic modality, collective skills are also needed in individual sports, not only in collective sports. The whole “team” is not just the sum of its parts – athletes. On the contrary, some collective skills (i.e. collective self-efficacy) are also important for cohesion, cooperation and comradeship. Basic collective skills are social skills and work-team skills. Coaches are included in this work along with athletes. These basic collective skills will be the bases of other complex collective skills.

On the other hand, there are two set of basic skills which are necessary from the beginning of the athletic trajectory. These are related to fairplay, on one hand, and to health and daily-life, on the other hand. Values, attitudes and behaviors of sportsmanship and fairplay are constantly enhanced in all the phases of psychological intervention. The same is true for health promotion behaviors (i.e. hygiene or nutrition in sport) and daily-life skills (i.e. school or social relationships).

Figure 3 shows schematically these basic skills.



**Figure 3** Basic psychological skills domains.

Psychological skills training properly include several elements. First, information on the skill to be trained is offered to athletes along with information on its relevance. Second, an exhaustive functional-evaluation (behavior, antecedents, outcomes) of baseline level of control on the skill is performed. Third, it is established a criterion level of control, which is the desired level of control pretended to be reached. Fourth, athletes are trained in psychological resources required for self-regulation. Learning principles and strategies are encouragingly cared for. Instructions, self-instructions and modeling are used amongst other learning strategies. Fifth, athletes rehearse skill use in controlled situations. These situations are, first, imagined ones, then, simulated ones, and, finally, actual contexts, which are initially programmed to assure successful performances. A continuous monitoring of learning, practice and effectiveness is performed both by the psychologist and coach and by the athlete himself or herself. Feedback provided to the athlete from this monitorization allows him or her to adjust process, to solve possible problems or to advance to next step. This feedback is informational feedback on his/her performance, correction feedback as well as contingent reinforcement and self-reinforcement. Next step is progressive practice in actual competition, demanding conditions. Some preliminary precompetition, competition (for every phase of competition) and postcompetition routines can be now elaborated and practiced. These new conditions of practice are actually not controlled by psychologist or athletes at all, so here it is very important to be cautelous in the application of learned skills. Because of that, actual practice should be also well-programmed with continuous testing of the skill use in progressive demanding contexts. Nevertheless, athlete's practice should continue from

learning, although nothing was done explicitly by the psychologist. All this programmed and non-programmed individual practice is aimed to increase the perception of control of the athlete in his/her resources as well as his/her confidence on them. The ultimate goal is the automatization of skills acquired, the complete integration of them in the behavioral repertoires of the athlete and the full inclusion of self-monitoring and self-regulating resources in sport actuations, so maintenance strategies are used at this point. Besides, generalization of learning should now be encouraged as an ideal objective of training. Figure 4 shows briefly the component and tools of psychological training.

Components of psychological training	Tools of psychological training
Self-observation Self-consciousness Self-control and self-regulation Relevant sport psychological skills Other relevant psychological skills Daily-life skills Intervention compliance Self-determination/agency	Brief speeches Written materials Observation/self-observation Instruction/self-instruction Modeling Imagery Practice in training sessions Practice in competitive settings Action plans or routines Self-monitoring Feedback, correction and reinforcement/self-reinforcement Generalization and maintenance strategies

**Figure 4** Components and tools of psychological training.

Is at this point when Ravizza (2001) *self-consciousness* is relevant. The athlete is aimed to identify his actual states and his optimal states, then to compare them, then to decide if his actual states are in the range of optimal states, and then to self-regulate his actual states to reach optimal states, or, in the contrary case, to maintain his actual, optimal states. As the athlete achieves a complete self-consciousness ability, he would detect in advance when he is not at optimal states for plenum performances. This early detection will help him to get his "optimal zone" back as soon as possible, which will increase indeed the perception of controllability.

For example, imagine we are aimed to train an athlete in activation control skill. We explain the athlete what activation is, its causes, its manifestations and its outcomes. We explain the athlete he can learn how to detect his activation states and how to self-regulate them to increase or to decrease his activation level. Then, the athlete is trained in self-observation in order to evaluate himself his current activation state. It is the beginning of *self-consciousness*. This self-evaluation includes to monitorize activation levels both in successful performances and non-successful ones, which will allow him to determine his baseline, his current states and his optimal range of activation for peak performance. Once this optimal state is well-established, athlete is trained in activation self-management (increasement, decrease, transduction to positive energy) effective resources. The athlete then practices the use of the skill to gain mastery in its regulation. In order to facilitate the use of the skill in "real" situations, practice trials in mental rehearsal as well as in actual conditions are offered, which are progressively more analogous to competitive stressful conditions. Feedback is obtained from practice itself and from athlete's experiences, but also from others (including the psychologist monitorization), so that an evaluation of evolution can be obtained. This feedback also provides information which is useful to adjust the application of the trained skill (i.e. it is known that athlete feels a high muscular tension in the right arm, prior to start a point after several failures, which impedes him to perform well; adjustments will be destined in this case to emphasize the control of right arm muscular tension in such circumstances).

As an orientative guide, a typical working session will last for 45-60 min., as a function of its contents and evolution. It will be once per week, although some skills may require to be worked in more than one session per week. They can be collective or individual, depending on the skill. The first 5 min. can be devoted to the revision of tasks ordered in the last session. Next 10-20 min. can be devoted to the discussion of psychological factors implicated in sport performance and to debate on athletes' usual psychological functioning in trainings or competitions and on their beliefs on their performance and success. This information is derived from prior assessment. The next 30 min. can be devoted properly to the training of psychological skills. The last 5 min. are devoted to the specification of the assessment or practice tasks to be performed during the week until next session. It is indispensable that athletes practice everyday the competencies they are acquiring. After each session, sport psychologist must consider the appropriateness of contents, structure, evolution, etc. of the session in a critique, constructive manner.

The last two months of the 1<sup>st</sup> macro cycle are usually plenty of championship first competitions. It is time to practice the acquired skills in real conditions as we have stated previously. We carefully plan the psychological preparation of this part of competition schedule for an integrated, successful, enriched practice of acquired skills. Action plans or routines can also be tested at this point. Main aims of this part of the 1<sup>st</sup> macro cycle are, hence, practice, evaluation and revision of athletes' learned resources.

#### *Technification psychological work.*

The 2<sup>nd</sup> macro cycle is destined to gain mastery on using psychological skills acquired in the previous one. Players should execute these skills in an automatised and adapted to demands manner for gaining such mastery in order to use them in subsequent competitions, the more important ones.

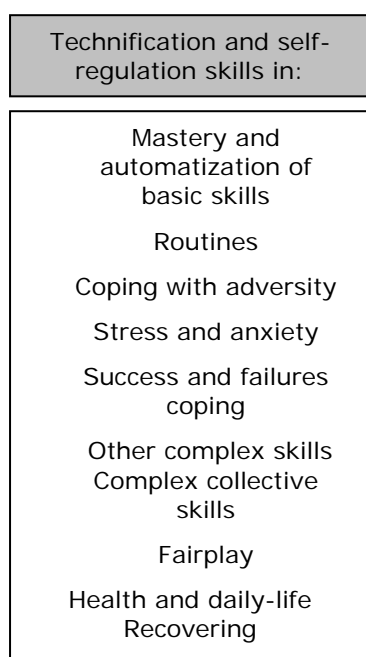
This macro cycle starts with a recovering period (1 month) in which outcomes of previous psychological work can be reviewed and adjusted. New goals can be set. Among these new goals, technification in psychological self-regulation must be inserted. This means to increase the athlete's control and self-regulation abilities to a maximal level. An adequate mastery in using these abilities will allow the athlete to use them and to learn other complex, specific skills for coping with adversity, which include stress and anxiety control, injuries prevention or rehabilitation, withdrawal prevention or solving personal problems affecting the athletes (i.e. family problems). These coping strategies will enable them to deal with the various types of adversity that could impede ideal performance states. As a part of these coping with adversity skills we can train athletes in (success and) failures coping skills.

On the other hand, in later phases, we have to prepare the athlete for his or her confrontation to most important competitions. Principal and alternative precompetition, competition and postcompetition routines established in prior phase are reviewed, adapted and reelaborated in order to adapt them to new competition demands.

Other relevant complex skills, such as reflexivity-impulsivity styles of action, can be now examined, and considerations can be made for each match phase.

It is time also to enhance other complex collective skills, such as collective decision-making abilities, collective problem-solving abilities or collective self-efficacy.

Objectives of this macro cycle are presented in figure 5.



**Figure 5** Technification work domains.

Finally, once competitions are finished, outcomes should be checked and new goals can be informally established to be considered in next season. But, parallel, psychologist must work along with coaches in the recovering process of athlete.

At this moment, the final assessment of the program quality and effectiveness should be performed, and satisfaction of athletes and coaches must be taken into account also as an outcome of psychological intervention success.

The program evaluation can be achieved throughout several change indicators, as objective performance parameters or psychological assessment tools, self-reports on behalf of athletes and coaches or other relevant ones, interviews, collective and individual debates, etc. Objective and subjective information should be obtained as indicators of quality and effectiveness of psychological intervention and participant satisfaction (Weinberg & Gould, 2007; Williams, 2001). Hence, both quantitative and qualitative methods of assessment should be used.

Some questions that should be answered at this phase are the following: Have level of control on psychological skills and sport performance been increased, and how much did they increase? Have changes been maintained appropriately? Do athletes use acquired skills in new situations? Are these increases derived from the administered intervention, or perhaps other variables can explain observed changes? At what extent tools employed in the intervention are appropriate? Which tools or activities are more useful? Are collective sessions better than individual sessions, or for which goals are they preferred? Is the intervention large, broad and deep enough? Is it necessary to go on with any issue in future interventions with the same athletes? Did the psychologist do his or her best? Was him/her fully expert, communicative or accessible? Which are the strengths and weaknesses of the offered intervention? Is it necessary to add or to eliminate any element of the program? Do the athletes inform of a satisfactory fulfillment of expectations? Do they conceive intervention as useful?... Some self-reports may also be used in assessing satisfaction with the intervention, such as that by Partington & Orlick (1987a,b).

As we have commented on, continuous monitoring should also be performed. This monitorization may be performed session to session or part to part, but also at least three controls are performed: In the first recovering period between macro cycles, in the middle approximately of 2<sup>nd</sup> macro cycle, prior to most demanding competitions, and at

some point in the last phase of the same macro cycle, during the most demanding competitions.

## **5. Main results of NSTP-Psychological intervention with Table Tennis selected athletes**

Since psychological intervention in the NSTP for table tennis is very recent, we have not already enough data on its results. Nevertheless, there are some questions that can now be answered and which can be considered as the initial steps of our work in the NSTP. The questions and answers are the following:

Are young athletes sufficiently skilled in psychological area to confront sport demands?

NO. As results of performed assessments show (Godoy-Izquierdo, Vélez & Pradas, in press a,b), young players show consistently an important deficient level of control on some relevant skills such as activation and anxiety control, use of self-talk, attribution of success and failures, coping with success and failures, use of visualization, attention control, reflexivity-impulsivity style and self-confidence, although they show a higher level of control on other variables and skills such as sport motivation, daily motivation, competitive motivation, relationships with pairs, coach or parents and fairplay.

Does experience in sport necessarily increase psychological skills of players?

NO. As our results showed (Godoy-Izquierdo et al., in press a,b), players with more years of athletic and competitive experience showed lower control for several psychological skills and a lower global mental control compared to novel players. Nevertheless, no significant differences were found between more experienced players and novel players.

Do gender explain some of the differences found?

NO. Non-significant differences due to gender have been found, although girls tend to show higher deficits in some variables and higher abilities in others compared to boys and vice versa (Godoy-Izquierdo et al., in press a).

Are deficits found exclusive of table tennis young players?

NO. Comparisons to other racket sports such as badminton and to other sport modalities such as soccer tend to show the same results (Godoy-Izquierdo et al., in press b).

Are young players disposed to a psychological intervention inserted in their integral formation process?

YES. They are able to acknowledge the importance of psychological skills in sport, they are aware of their resources, deficits and needs, they recognize their need of a complete formation which includes psychological enhancement, and they found this intervention very useful (Godoy-Izquierdo et al., in press a,b; Vélez & Godoy-Izquierdo, unpublished document).

Does psychological intervention increase sport performance, self-agency and subjective satisfaction with sport?

YES. Young athletes who receive psychological intervention are more self-determined, more self-controlled, more efficacious, more successful and manifest more well-being and more satisfaction and adherence than non-skilled non-trained athletes (Vélez & Godoy-Izquierdo, unpublished document).

In conclusion, results have indicated the suitability of considering psychological assessment and training for the complete preparation of players in order to improve psychological skills which allow them to confront adequately the increasing demands of sport participation in accordance with the advancement of their implication. This is highly relevant in the case of individual and collective sports modalities, as well as in the identification and formation of talents, particularly in racket sports, and specifically in table tennis.

## REFERENCES

- Balagué, G. (1993). Els rols del psicòleg de l'esport. In *Actas de las X Jornades de l'Associació Catalana de Psicologia de l'Esport* (pp. 48-55). Lleida: ACPE.
- Buceta, J.M. (1998). *Psicología del entrenamiento deportivo*. Madrid: Dykinson.
- Buceta, J.M. (2004). *Estrategias psicológicas para entrenadores de deportistas jóvenes*. Madrid: Dykinson.
- Chen, D. & Singer, R.N. (1992). Self-regulation and cognitive strategies in sport participation. *International Journal of Sport Psychology*, 23, 277-300.
- Cornelius, A.E., Silva, J.M., Conroy, D.E. & Petersen, G. (1997). The projected performance model: relating cognitive and performance antecedents of psychological momentum. *Perceptual and Motor Skills*, 84, 475-485.
- Cruz, J. (1997). *Psicología del deporte*. Madrid: Síntesis.
- Csikszentmihalyi, M. (1991) (2<sup>nd</sup> ed.). *Flow: the psychology of optimal experience*. New York: Harper Perennial.
- Danish, S.J., Fazio, R.J., Nellen, V.C. & Owens, S.S. (2003). Teaching life skills through sport: community-based programs to enhance adolescent development. In J.L. Van Raalte & B.W. Brewer (eds.), *Exploring sport and exercise psychology* (pp. 269-288). Washington, DC: American Psychological Association.
- Godoy-Izquierdo, D., Pradas, F. & Vélez, M. (in press). El entrenamiento de destrezas psicológicas en tenis de mesa: planificación para una temporada. In F. Pradas y D. Godoy-Izquierdo (dirs.), *Los deportes de raqueta y pala: Fundamentos y aplicaciones de las Ciencias del Deporte: Tenis de mesa*. Zaragoza: Universidad de Zaragoza.
- Godoy-Izquierdo, D., Vélez, M. & Pradas, F. (in press a). Nivel de dominio de las habilidades psicológicas en jóvenes jugadores de tenis de mesa, bádminton y fútbol. *Revista de Psicología del Deporte*.
- Godoy-Izquierdo, D., Vélez, M. & Pradas, F. (in press b). Nivel de dominio de las habilidades psicológicas en jóvenes jugadores de deportes de raqueta y pala: tenis de mesa y bádminton. *Cuadernos de Psicología del Deporte*.
- Godoy-Izquierdo, D., Vélez, M., Ramírez, P. & Andréu, M.D. (2001). *Cuestionario de Habilidades Psicológicas y Comportamientos en el Deporte de Competición-Escala infantil-juvenil (CHPCDC)*. Experimental version.
- Godoy-Izquierdo, D., Vélez, M., Ramírez, P. & Andréu, M.D. (2006). Cuestionario de Habilidades Psicológicas y Comportamientos en el Deporte de Competición-Escala infantil-juvenil (CHPCDC). In V.E. Caballo (dir.), *Manual para la evaluación clínica de los trastornos psicológicos* (in attached Cd). Madrid: Pirámide.
- Gould, D. & Udry, E. (1994). Psychological skills for enhancing performance: arousal regulation strategies. *Medicine and Science in Sports and Exercise*, 26, 478-485.
- Gill, D.L. (2000) (2<sup>nd</sup> ed.). *Psychological dynamics of sport and exercise*. Champaign, IL: Human Kinetics.
- Hanin, Y.L. (1995). Individual zones of optimal functioning (IZOF) model: an idiographic approach to performance anxiety. In K. Henschen & W. Straub (eds.), *Sport Psychology: An analysis of athlete behaviour* (pp. 103-119). Long meadow, MA: Movement.
- Hardy, L., Jones, G. & Gould, D. (2003) (8<sup>th</sup> ed.). *Understanding psychological preparation for sport*. Chichester, UK: John Wiley & Sons.

- Jackson, S.A. & Csikszentmihalyi, M. (1999). *Flow in sports*. Champaign, IL: Human Kinetics.
- Marí, J. (1997). Programa de entrenamiento psicológico para jugadores de tenis de mesa de alto nivel. *Revista de Psicología del Deporte*, 6, 77-88.
- Olmedilla, A. (2002). Programas de intervención psicológica en contextos deportivos. In A. Olmedilla, E.J. Garcés de los Fayos & G. Nieto (Coords.), *Manual de Psicología del Deporte* (pp. 181-207). Murcia: DM Librero-Editor.
- Orlick, T. (2000) (3<sup>rd</sup> ed.). *In pursuit of excellence: how to win in sport and life through mental training*. Champaign, IL: Human Kinetics.
- Partington, J. & Orlick, T. (1987a). The sport psychology consultant: Olympic coaches' views. *The Sport Psychologist*, 1, 95-102.
- Partington, J. & Orlick, T. (1987b). The sport psychology consultant evaluation form. *The Sport Psychologist*, 1, 309-317.
- Petitpas, A.J., Danish, S.J. & Giges, B. (1999). The sport psychologist-athlete relationship: implications for training. *The Sport Psychologist*, 13, 344-357.
- Ravizza, K. (2001). Increasing awareness for sport performance. In J.M. Williams, *Applied sport psychology: personal growth to peak performance* (pp. 179-189). Mountain View, CA: Mayfield Publishing Company.
- Smith, R.E. & Smoll, F.L. (2003). Youth sports as a behavior setting for psychosocial interventions. In J.L. Van Raalte & B.W. Brewer (eds.), *Exploring sport and exercise psychology* (pp. 339-371). Washington, DC: American Psychological Association.
- Taylor, J. & Demick, A. (1994). A multidimensional model of momentum in sports. *Journal of Applied Sport Psychology*, 6, 51-70.
- Vallerand, R.J., Colavecchio, P.G. & Pelletier, L.G. (1988). Psychological momentum and performance inferences: a preliminary test of the antecedents-consequences psychological momentum model. *Journal of Sport and Exercise Psychology*, 10, 92-108.
- Van Raalte, J.L. & Brewer, B.W. (eds.) (2003) (2<sup>nd</sup> ed.). *Exploring sport and exercise psychology*. Washington, DC: American Psychological Association.
- Vealey, R.S. (1988). Future directions in psychological skills training. *The Sport Psychologist*, 2, 318-336.
- Vélez, M. & Godoy-Izquierdo, D. *Psychological enhancement training in young athletes*. Unpublished document.
- Weinberg, R.S. & Gould, D. (2007) (4<sup>th</sup> ed.). *Foundations of sport and exercise psychology*. Champaign, IL: Human Kinetics.
- Weiss, M. (1991). Psychological skill development in children and adolescents. *The Sport Psychologist*, 5, 335-354.
- Weiss, M. (1995). Children in sport: an educational model. In S.M. Murphy (ed.), *Sport Psychology interventions* (pp. 39-69). Champaign, IL: Human Kinetics.
- Williams, J.M. (2001) (3<sup>rd</sup> ed.). *Applied sport psychology: personal growth to peak performance*. Mountain View, CA: Mayfield Publishing Company.