THE TEACHING-LEARNING-TRAINING PROCESS IN RHYTMIC GYMNASTICS SUPPORTED BY THE ECOLOGICAL THEORY

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Abstract

This study aimed to analyze and compare the structure of the teaching-learning-training process in children's Rhythmic Gymnastics. Seventeen girls, aged 10 to 12 years, who were members of the Rhythmic Gymnastics initiation classes for athletes in the cities of Florianópolis-SC (n = 11) and Maringá-PR (n = 6) participated in this study. A systematic observation method was used for data collection during the typical weeks of training. Chi-square and, when necessary, the Fisher Exact Test were used for statistical analysis. Using aspects of the Ecological Theory, the results showed a similarity between the structure of teaching-learning-training process, as the activity identification, the tasks progression, and coaches' and athletes' conduct. It is possible to conclude that the evidence seems to confirm the use of a methodological approach in teaching RG founded on notions of progressions of exercises through the refinement and application of the technique. On the other hand, it has also become evident that interpersonal relationships that go through the training programs need to be re-evaluated.

Keywords: *rhythmic gymnastics, teaching, learning, training, ecological theory.*

INTRODUCTION

Considering that Rhythmic Gymnastics (RG) has become more visible, mainly in athlete training centers, schools, and particularly in the media, it is expected that many studies related to RG would have been carried out. However, there is a lack of academic work in this area, and studies that have been conducted have mainly focused on high performance aspects of the sport. There are few studies related to RG that have focused on the different levels and methods of teaching and learning, as well as studies that consider the training environment or classroom.

Among the few academic papers in Brazil, the ones which stand out were written by Crause (1985), Freire (2003), Freire & Scaglia (2003), Nísta-Piccolo (1999), Oliveira (2002), and Paes (1996). These have indicated the necessity to adapt models of teaching and learning to children's characteristics and interests. Relevant studies were also carried out by Marques (1997 and 2001), which traced the proximity of training models between schools and clubs, in addition to similarities regarding RG teaching for different age groups and levels.

Another problem with RG is the emphasis given to technical teaching. RG is one of the modalities that requires a certain level of technical expertise from its practitioners due to the complexity of its rules and movements. However, it also involves creativity, beauty, feelings, sensations, behaviors, and actions. This diversity of elements favors different forms of education and raises questions about the

organization and systems of practice, and consequently, on the methods that are used by coaches.

In this context, it is essential to better understand how RG has been taught in athlete training centers. Therefore, we attempted to conduct a study that identified the structure of activities and tasks of the RG teaching-learning-training process, from the perspective of the practice environment and of the relationships between the people involved. The theory underpinning this study is the Bronfenbrenner Ecological Theory.

The ecological approach developed by Bronfenbrenner (1979, 1992), was previously used in studies carried out by Haddad (1997), Krebs (1993, 1995), Stefanello (1999), and Vieira (1999). It states that human development results from the dynamic relationship between humans and the environmental context. For the author, the relevance of this approach relates to the quality of contexts and on understanding the extent to which these contexts facilitate or inhibit the developmental processes of the individual. Thus, there is a dynamic relationship between human development and its constant interactions with the environment. This process, in turn, is composed of elements that mutually interact with each other and simultaneously affect development.

Bronfenbrenner's ecological approach to human development is organized in sequential structures or systems known as the macro system, mesosystem, exosystem, and microsystem. The person being developed can be influenced by these systems. The ecological environment also includes the interconnections between the environment and external influences from the contexts in question.

The structure analyzed in this study was the micro system, which is characterized by a more immediate and more contextualized dimension of development. By Krebs (1995) this provides an initial outline for understanding the development of an individual; the microsystem is defined as a dimension that allows face-to-face interaction between the developing person and his/her values and beliefs.

According to Martins & Szymanski (2004), the microsystem includes environments such as the home, daycare center, or school. These can be viewed as locations where behaviour change and personal development occur. In addition, the microsystem is comprised of three theoretical aspects: (1) molar activities that provoke development with a certain temporal persistence and a meaning or intention behavior (Krebs, 1995); (2) the interpersonal structures that are formed by the dyads and are established by the relationships between two people (a bi-directional relationship); and (3) the roles, which, according to Nascimento (2003), involve the integration of activity and relationship elements in terms of social expectations.

In addition to Bronfenbrenner's ecological theory, for this investigation, the theoretical field research model was used. This model goes beyond the description of causal processes, that are concerned with specifying and analyzing particular processes that take place in the RG context, since it directly affects the development of children who engage it actively (Stefanello, 1999).

Given the above, the aim of investigating the microsystem in RG was to unravel the inter-personal relationships, the acquisition of new skills, and the proximal processes that sports provide. This will allow, according to Alonso (2004), new possibilities so that the teaching-learning-training process is better structured and developed.

In this sense, the objective of this study was to analyze the structure of the teaching-learning-training process in children's Rhythmic Gymnastics, trying to identify whether there are differences in the complexity of the activities, tasks and teams in the ecological field that was investigated.

METHODS

Among the models of theoretical research identified by Bronfenbrenner (1992), this research is characterized by the person-process-context paradigm, which provides information on the characteristics of people (athletes and coaches), on the processes by which development occurs (teaching-learning-training process), and on systematic information about the context involved (microsystem). This model allows us to analyze variations in the developmental process and outcome in a conjoint function of environmental and person's characteristics performance (Vieira, 1999).

Moreover, according to the classification adopted by Carreiro da Costa (1986), this research also constitutes an educational investigation, conducted in the natural environment of teaching, through the paradigm of Presage-Process-Product. The variables relevant to the presage step are those intentions and actions that teachers have while they are in a teaching situation. In this research these variables are represented by the characteristics of coaches that influence the Teaching-Learning-Training process. The process is comprised of the behaviors adopted by athletes and coaches, and the product refers to the effects on athletes' learning and development.

The benefits of this approach include the possibility to highlight the importance of the decisions and behaviours in learning activities, to identify the nature of the teaching behaviors of coaches, and to highlight the importance of studies in a natural educational environment.

Participants were from two teams, totaling 17 female child rhythmic gymnasts (aged 10 to 12 years). 11 girls were from the State Institute of Education (Instituto Estadual de Educação) in Florianópolis, Santa Catarina, and 6 girls were from the CIAGYM (Integrated Centre for Care Generator Movement for Citizenship - Centro Integrado de Assistência Gerador de Movimento para Cidadania) from Maringá, Paraná. The final sample was determined by the number of signed ICES (Informed Consent and Explanation of Subjects) (TCLE - Termo de Consentimento Livre e Esclarecimento dos Sujeitos) from parents or guardians. The research protocol was approved by the Ethics Committee of Human Research of Santa Catarina Federal University (Universidade Federal de Santa Catarina - UFSC) (Case 066/07).

Analysis of the structure of the teaching-learning-training process was performed during typical weeks of training in the child category of RG, and was meant to examine the micro sports of each team. In the data collection direct and systematic observation of training was used, together with the use of a camera, and later transcribing the data onto observation forms. We filmed four training sessions each month, amounting to twelve sessions for each team, over three months.

The observation system was adapted from procedures used in studies by Stefanello (1999), Nascimento & Barbosa (2000), Saad & Nascimento (2003) and Silva (2004) to include a detailed analysis of the exercises performed. The analysis of the training sessions used three broad spheres: complexity of activities, complexity of tasks, and complexity of ecological field.

In analyzing the structural complexity of the activities the aim was to describe in detail the activities that were part of the training sessions, the duration of each activity, and their spatial characteristics.

In analyzing the structural complexity of the tasks, we sought to identify: (a) the function of the tasks as a global acquisition of technique (which aims to obtain information on movement and motor development); (b) technique fixing/ diversification (focuses on aspects of technical execution, referred to the critical points of its achievement); (c) application of the technique (trying to apply technical skills in a sequence of movements), and (d) competition (which identifies the application of technical skills in situations that portray the requirements of official competition).

Subsequently, we ranked the tasks conditions as an individual foundation (learning basic movements of RG exercise slowly and methodically), a combination of fundaments (two or more basic foundations of RG, without musical accompaniment), and range of movements (sequence of motions with musical accompaniment).

The task success criteria aimed to rank the criteria as to focus on the achievement of the correct movements (efficiency), on the result of the movement (effectiveness) and the application form of each situation (adaptation in the series of movements).

In analyzing the complexity of the ecological field, we classified the involvement or conduct of the coaches in relation to: initiation by the coach (coach sets the activity to be performed), centered on the coach (coach controls the specific movements to each athlete), and feedback (trainer provides information after the athlete's movement, movement velocity, correcting, modeling, or refocusing). Finally, we sought to characterize the involvement or athletes' conduct as congruent (athlete's conduct corresponds to the task posed by the trainer), modifying (athlete's conduct changes letting the task easier or more difficult), supportive (athlete's conduct to assist in performing other's task), and standby (athlete's conduct to wait, pause, and take a while to accomplish task).

For statistical analysis and description of the data, Microsoft Excel and SPSS (version 13.0) were used. Chi-square, and when the assumptions of this test were violated, Fisher's exact test were used. Significance was set at $p \leq 0.05$.

RESULTS

Structural Complexity of Activities (identification of activities, duration, and spatial boundaries)

In the training sessions of the two teams seven molar activities were identified: stretching, flexibility training, physical preparation, materials handling, and assembly of sets, no music training series, training series provided with music and ballet using bar and/or ground training. Almost all the activities were part of most of the training sessions and there was little variation in the content of the daily training sessions. The similarities between the training sessions of both teams shows that RG training generally follows a routine that is repetitive, monotonous and disciplinarian.

When characterizing RG sportive microsystem, Stefanello (1999) found that, throughout the research process, the same activities were carried out in every training day, both during warm-up, and during the technical preparation phase. Stefanello explains that there was little variation in the sequence of exercises and in the content of sessions, which agrees with the results in this research.

The first features identified in the RG training sessions were the long duration of the sessions and the restricted content. Usually, sessions take around two to five hours daily, in a frequency of 3 to 6 days per week, depending on the skill level of practitioners and the category. In the analyzed teams there were four training sessions per week of around four hours per day. Thus, during the three months of this investigation, three weeks were observed, meaning 12 training sessions for each team, total 2,588 minutes of training for team A, and 2,057 minutes for team B. Table 1 shows the temporal persistence of the main activities carried out by RG teams that were investigated.

Table 1. *Temporal persistence of activities structuring in the GR teams.*

TEAM A	Time	TEAM B	Time
1. Training series with music	710 ‘	1. Training series with music	785 ‘
2. Stretching	525 ‘	2. Training series with music	354 ‘
3. Training of the series without music	383 ‘	3. Stretching	342 ‘
4. Ballet Bar/Ground	330 ‘	4. Training flexibility	200 ‘
5. Physical preparation	292 ‘	5. Physical preparation	166 ‘
6. Materials handling and setting series	253 ‘	6. Materials handling and setting series	108 ‘
7. Training flexibility	95 ‘	7. Ballet Bar/Ground	102 ‘
Total	2588‘	Total	2057‘

Training with music was the activity used most frequently by both teams, which comprised 710 minutes for team A and 785 minutes for team B. In team A, training session activities included stretching, training series without music, bar-ground ballet, physical preparation (materials handling and setting the series), and flexibility training. Activities used in team B sessions included stretching, flexibility training, physical preparation (materials handling and setting the series), and bar/ground ballet.

Overall, it was noted that the analyzed teams presented similarities regarding the structuring of activities in the observed training sessions, since the three activities most frequently used were the same for both teams. Afterwards, it was possible to realize that there was only one inversion in the presence of ballet activities in team A, and the presence of flexibility training activities in team B. The activities carried out comprised three segments of training: physical preparation, technical preparation, and ballet. The physical preparation segment, often carried out at the beginning of sessions, included activities such as stretching, flexibility training, and physical preparation exercises (abdominal, vertical jump, and strength). The technical preparation segment featured activities of handling/setting series, training series without music training, and training series with music. Finally, the ballet segment was constituted by ballet activities performed on the bar and/or on the floor.

Sessions always started with physical preparation followed by technical preparation, with ballet interspersed. During practice, athletes often had a 15 minute break for eating and recovery. However, it was possible to notice that the training sessions of the two teams were more focused on technical training (training series with music, the series without music training, and handling/setting series, consecutively), showing a greater concern for the correct completion of exercises. In this respect, during almost all the sessions, the athletes focused on the difficulty of the series, i.e., isolated or combined movements that correspond with the rules set out in the 2007 Code of Points (Código de Pontos de 2007).

The analysis of spatial delimitation for team B focused on one main court of the gymnasium, which was divided into two RG sub-blocks. One of these areas was demarcated by a carpet and the other was not. A ballet room was also used for their training. However, on several occasions this team faced problems with the availability of these spaces. Unavailability was caused by structural problems and other forms of training modalities happening at the same time. As a consequence, the team had to use other available spaces, such as the gymnasium stairwell, the lobby, etc., which were limited and inadequate for practicing

RG. In these alternative spaces there were often no adequate materials, which negatively affected the training sessions. Even the safety fence that surrounded the courts was used as a ballet bars.

Another problem faced by team B was the extra presentations that were not programmed in the structuring of the trainings. These unexpected situations had the following effect: first, they negatively affected the work of technical training, however they gave a new positive meaning to the athletes' action, in which they were the ones who planned the routines (without the necessity of meeting the rules of the Code of Points), developing creativity, self-confidence, teamwork and autonomy.

Team A had one main court for RG where the athletes stretched and practiced their series individually with music. There was also an area booked for the practice of gymnastics, where the athletes practiced their routines individually and together with the whole group. This court also had a ballet bar. During this study no unexpected use of this group's space was noted.

Structural Complexity of Tasks (function, classification, and success in tasks criteria)

The detailed analysis of the task allowed a precise description of the gradual shift of progressions, refinement, and application of exercises in the RG teaching-learning-training process.

According to Mesquita (1997), progress includes the interference in the degree of the tasks complexity so that without taking away the essence of the learned behavior, the acquisition is gradual, with a progressive increase in the levels of demand. In this respect, the training contents must be organized by establishing constant links between what was acquired and what will be the acquisition focus, in an increasing evolution perspective, always referring to before and after periods. Furthermore, the progressions must be adjusted to the characteristics of the training factors (complexity, intensity, and volume), and to the athletes' characteristics. In RG, three progressive elements add up to the function of the tasks: technique acquisition, fixation and technique diversification, and technique application and competition.

Regarding the function of the task (Table 2), the results reveal that technique acquisition was less frequent in the tasks performed by the investigated teams (team A 23.3%, and team B 17.4%). These percentages can be justified by the short time devoted to ballet - the segment of training that most emphasized technique acquisition (the technique acquisition depends directly on the degree of complexity of a motor task, the number of elements necessary to be coordinated and the network of relationships established between these elements).

Tabela 2. *Frequency and percentage of the function of the tasks of the teams.*

Function of the task	**Team A**		**Team B**		**Total**		**P**
	f	***%***	***f***	***%***	***f***	***%***	
Technique acquisition	10	71.4%a 23.3%b	4	28.6%a 17.4%b	14	100.0%a	
Fixation/technique diversification	19	76.0%a 44.2%b	6	24.0%a 26.1%b	25	100.0%a	0.162
Technique Appliance/ Competition	14	51.9%a 32.6%b	13	48.1%a 56.5%b	27	100.0%a	
Total	43	100.0%b	23	100.0%b	66	100.0%a/ b	

Legend: a=line; b=column

The most frequent exercises in team A were: fixing and technique diversification (44.2%). This function is characterized mainly by technique refinement, focused on the most difficult aspects of accomplishment. In the RG training sessions fixation and diversification were made up of constant repetitions and variations of isolated movements and combinations, with or without the use of appliances.

Similar to RG, in the team sports categories it was possible to conclude that the repetition of technical gestures is also the most widely used method of learning. This method disregards the process of construction and comparison of existing knowledge with the knowledge that is acquired (Moreira, 2005).

In team B the most frequently used functions were technique and competition application exercises (56.5%). In RG, the technique application exercises in RG competition are used in situations that contain the characteristics of a series, being a whole sequence or only a part of movements organized according to the difficulty required in the Code of Points. The competition exercises are evidenced when performed with musical accompaniment in a complete sequence of movements, from the beginning (initial pose) to the end (final pose).

However, during the technical preparation of team B there was no concern regarding the execution of movements, since most of the tasks were aimed at training the series as a whole. On this topic Mesquita (1997) warns that athletes need, above all, to learn how to execute correct technique in order to proceed with further actions. Thus, insofar as certain technical errors occur, they become increasingly more difficult correct, which in turn may compromise the correct movement execution. Therefore, for the author, teaching technical skills should be done in isolation, which can minimize the occurrence of erroneous automatisms and difficulties that need to be correct.

The ratings of the task, presented in Table 3, revealed that team A has focused its learning process on a combination of fundaments (46.5%). These data demonstrate the importance this team attributed to training and to the repetition of the difficulties that composed the series. This team used to direct most of the segment to technical preparation for the refinement and improvement of technique. However, the practice in team B was directed mainly at the foundation series (47.8%), which characterizes the teaching-learning-training process in a more general, broad and global way.

Table 3. *Frequency and percentage frequency of the classification of the tasks of the teams.*

Task classification	**Team A**		**Team B**		**Total**		**P**
	f	**%**	***f***	**%**	***f***	**%**	
Individual fundament	8	66.7%a 18.6%b	4	33.3%a 17.4%b	12	100.0%a	
Combination of fundaments	20	71.4%a 46.5%b	8	28.6%a 34.8%b	28	100.0%a	0.567
Series of fundaments	15	57.7%a 34.9%b	11	42.3%a 47.8%b	26	100.0%a	
Total	43	100.0%b	23	100.0%b	66	100.0%a/b	

Legend: a=line; b=column

The results found point to several different methodological trends in the teams investigated. While the process of teaching and learning of team A stood mainly on refining techniques with characteristics of the analytical method, and team B focused the process in practicing the movement in a more globalized way, with characteristics of a global method.

On the issue of RG teaching methods, there is no consensus in the literature. For Pereira (1999), the movements should be taught in isolation, with the elaboration of a pedagogical sequence before associating them, gradually increasing the degree of difficulty to raise the level of learning. In return, Caçola (2005) asserts that by teaching through a global method better results can obtained. However, Mesquita's (1997) seems to have a more coherent approach, which proposes that the methodology used by the coach, when teaching skills, should not be standardized, but must meet the predetermined criteria in accordance with the selected objectives and contents.

Thus, the use of only one methodology becomes a reductionist action. Therefore, we must understand that during the teaching-learning process there may be different possibilities of education.

Another important aspect in structuring the complexity of the task is the criteria for success (Table 4). The success criteria are based on three key elements: efficiency, effectiveness and application on the situation. However, in the RG context, it became necessary to group the efficiency and effectiveness elements as a fourth element, due to variations of the sport in the use of materials (rope, ball, bow, ribbon and/or apples).

The results in Table 4 showed that the criterion application in the situation was the most frequent in both teams (32.6% of Team A, and 56.5% Team B). However, more than half of the percentage of team B was focused on this criterion, showing that the training sessions of this team were basically applied in the execution of the series, being the adaptation of tasks the priority in the movement series.

Table 4. *Frequency and percentage frequency of the criteria for task success of the teams.*

Success criteria	**Team A**		**Team B**		**Total**		**P**
	f	***%***	***f***	***%***	***f***	***%***	
Efficiency	12	80.0%a 27.9%b	3	20.0%a 13.0%b	15	100.0%a	
Effectiveness	10	66.7%a 23.3%b	5	33.3%a 21.7%b	15	100.0%a	0.24
Efficiency e effectiveness	7	77.8%a 16.3%b	2	22.2%a 8.7%b	9	100.0%a	0
Application in the situation	14	51.9%a 32.6%b	13	48.1%a 56.5%b	27	100.0%a	
Total	43	100.0%b	23	100.0%b	66	100.0%a/b	

Legend: a=line; b=column

Another important fact was that, in the two teams, the criterion that appeared least often was efficiency and effectiveness (team A 16.3% and team B 8.7%), something described as contradictory, facing the requirements of the modality, because concerning RG it is as necessary for the athlete to perform the movements correctly as it is necessary for her to obtain satisfactory results, especially when executed with materials. When launching a ball, jumping, and recovering a ball consecutively, the athlete should not be concerned only in making the jump right, but also in obtaining a good result when recovering the ball.

The criteria of efficiency and effectiveness analyzed separately, had better distribution in Team A, differently than in Team B that presented a much higher percentage to obtain results (21.7%) compared to the correct performance of movements (13.0%).

Ecological Field Complexity (conduct among coaches and athletes)

The last sphere to be analyzed was the Ecological Field, which refers to established patterns of behaviors among coaches and athletes and their established relationships in the sports microsystem.

The term 'conduct' refers to the individual conscientious behavior and is directly influenced by the expectations of others. Facing this, the ecological perspective identifies the emergence of social roles that directly interfere with the performance of activities and conduct relationships among coaches and athletes. According to Bronfenbrenner (1996), social roles represent the way each person should act and the way others act towards him/her. Moreover, the role expectations may determine how the person participates in a given context and the relationships that are created among her and the others.

Two lines marked the RG teaching-learning-training process, initiated by the coach and the athletes' congruent behavior. These procedures show the characteristic command style of the instruction and practice directly controlled by the coaches and followed and enforced by the athletes. As in the study carried out by Stefanello (1999), artistic gymnastics coaches took, virtually, all the decisions about what and how things should be done, overseeing the development in all of the activities.

In this study, similar data to that of the Stefanello (1999) study was obtained. It became evident in both investigated teams that the roles identified obeyed a relation of hierarchy. The coaches held total control of the training sessions, especially in the activities to be performed, while all the athletes performed consistently from the beginning to the end of the practice with no objection, in a fairly automated way.

In the interpersonal relationships among female athletes, the social role established during practice was determined by the technical level of each of them. The athletes who were more advanced, or had a better technical level, attracted the attention of others, especially during the training series with music.

Regarding the results presented in Table 5, it was possible to notice that in both teams the behavior initiated by the coach was the most frequent one (Team A 45.7% and Team B 63.5%). But in team A the behavior initiated by the coach with feedback was also evident (44.3%). However, there were no significant differences in the approaches adopted by the coaches.

Table 5. *Frequency and frequency percentage of the teams' coaches' behavior.*

Coaches behavior	**Team A**		**Team B**		**Total**		**P**
	f	***%***	***f***	***%***	***f***	***%***	
Initiated by the coach	32	49.2%a 45.7%b	33	50.8%a 63.5%b	65	100.0%a	0.148
Initiated by the coach /Feedback	31	67.4%a 44.3%b	15	32.6%a 28.8%b	46	100.0%a	
Centered on the coach	7	63.6%a 10.0%b	4	36.4%a 7.7%b	11	100.0%a	
Total	70	100.0%b	52	100.0%b	122	100.0%a/ b	

Legend: a=line; b=column

Regarding team B, it was possible to notice that the behaviors that were focused on the coach and initiated by the coach with some level of feedback presented low frequencies (7.7% and 28.8%), suggesting that the coach played a little active role during trainings in two aspects: in not controlling the activities and not providing information regarding the corrections of movements.

Opposing the action of the coach of team B, Cooke et al (2005) stresses that there must be a feedback in any teaching-learning process, because it contributes, at least, with four possible roles: motivation, reinforcement, information, and guidance. In this context, one must understand that feedback can be used as a favorable instrument for learning process of skills if provided in an appropriate and positive way (p. 128).

Adams (1971) in Chiviacowsky & Godinho (1997) also emphasizes that, in most cases, during their training, individuals are not able to trigger the mechanism of detecting and correcting errors. The author adds that when individuals are still developing the standard reference on the correct movement, it is crucial that additional information be provided to adjust and correct the next response, and to always come closer to the correct standard. Without this information, the individual can establish that a wrong standard is becoming more consistent.

According to Table 6, the results indicated that there are significant differences in the behaviors adopted by the athletes ($p = 0.002$). Thus, it was possible to notice that the congruent behavior was the most frequent in both teams (51.4% on team A and 36.5% in team B). On the other hand, less frequent behaviors differed between the teams. In team A, the least frequent behavior was the congruent one and the modifier one (11.4%), while in the B team it was the consistent and supportive behavior (3.8%).

Table 6. *Frequency and percentage frequency of athlete' teams' behaviors.*

Athlete's behavior	**Team A**		**Team B**		**Total**		**P**
	f	***%***	***f***	***%***	***f***	***%***	
Congruent	36	65.5%a 51.4%b	19	34.5%a 36.5%b	55	100.0%a	0.002
Congruent/ Modifier	8	36.4%a 11.4%b	14	63.6%a 26.9%b	22	100.0%a	
Congruent/ Supportive	14	87.5%a 20.0%b	2	12.5%a 3.8%b	16	100.0%a	
Congruent/ Waiting	12	41.4%a 17.1%b	17	58.6%a 32.7%b	29	100.0%a	
Total	70	100.0%b	52	100.0%b	122	100.0%a/b	

Although team A has shown a low percentage (20%) in the congruent and supportive behavior during the course of physical preparation (strength training, abdominals and jumps), it was established that there was interdependence among the athletes in some activities (activities done in pairs and with the help of more than one athlete). Similarly, Stefanello (1999) showed that in RG activities that requisitioned the interdependence among the actions of the athletes were also scarce.

Still in relation to the consistent and supportive behaviors, we must clarify that in RG there are two possibilities for exercise series, the individual and the group ones. In this investigation, although the group training of the series of movements presented collaboration among the gymnasts, they were not considered

supportive behaviors. This is because those procedures were not performed by the athletes as a free endeavor, but these were the requirements of the regulations imposed by the Code of Points.

In this sense, the main roles played by athletes in most of their training activities were only done by active and observing participants. The roles of the observers were seen in various situations, especially in the B team, both in the physical preparation (activities organized in rows) and in the technical preparation, during the series training.

By relating the behavior of the coaches with the conduct of athletes, regardless of the team investigated (Table 7), it was possible to identify the existence of a significant association between these variables ($p < 0.001$). This fact is evidenced by the behavior initiated by the coaches (44.6%), initiated by coaches with feedback (44.7%) and centered on the coaches (54.5%) when combined with congruent behavior of athletes.

Table 7. *Frequency and percentage frequency of the behavior of athletes in relation to the behavior of coaches.*

Coaches' behavior	**Athletes' Behavior**									
	Congruent		Congruent/ modifier		Congruent/ Supportive		Congruent/ Waiting		Total	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Initiated by the coach	29	44.6%	17	26.2%	13	20%	6	9.2%	65	100
Iniciated by the coach/ Feedback	21	44.7%	3	6.4%	2	4.3%	21	44.7%	47	100
Centered on the coach	6	54.5%	2	18.2%	1	9.1%	2	18.2%	11	100
										p<0.001

Overall, the results of this analysis show that there is a strong relationship established in social roles between coaches and athletes in RG. On this aspect, Mesquita (1997) assumes that there is a relationship of complicity between those who teach (coach) and the learners (athlete), which is embodied in matter of training (content of practice).

However, what really makes it crucial to the development process, according to Bronfenbrenner (1996), is not only the type of interpersonal relationship formed, but the quality of inter-relationships. That is, the degree of reciprocity established among the participants of the molar activities, the power dynamics established between elements of the interactions and the type of emotional relationship between them.

From this perspective, it is essential that professionals from this area understand and reflect on the relationships established in this context, between coaches and athletes, since the activities, roles, and interpersonal relationships experienced in an environment contribute significantly to the development of individuals. Bronfenbrenner (1992) also warns that extreme disorganization or stiffness in the structure and functioning of these relationships represent danger signals for psychological growth of the developing person, whereas intermediate degrees of flexibility are the optimal conditions for human development. This study shows that the training teams analyzed, in most cases, involve a high degree of stiffness, perhaps affecting the development of those involved.

CONCLUSIONS

From the characterization of the RG's sports microsystem it was possible to conclude that the structure of the teaching-learning-training process seems to be solidified regarding to its activities, to the organization of daily training sessions, as well as in interpersonal relations, and in social roles between coaches and athletes. The evidence confirms that the teams investigated presented almost the same structure, and differed only in their teaching methods.

As to the Structural Complexity of Activities, it was concluded that the molar activities developed in the training sessions of RG are similar in identification, but differ as to the duration. It was also found that the RG practice sessions were generally long, homogeneous, and repetitive.

The analysis of the Tasks Structural Complexity made it easy to identify some differences between the teams. While team A prioritized the development of fixation and diversification tasks of individual basic techniques, team B provided technical application tasks performed by systematized repetition of combinations and basic series. In RG practice there is a concern both with the refinement and improvement of technique, and with the factor of physical performance and motor performance of athletes. The evidence confirms the preference for the overall teaching method in team B, while in team A was most used of the analytical method or part of it.

Concerning the criteria of success, both teams concentrated on the application situation, i.e., adapting the movements in situations of series so that the athletes could develop a large repertoire in motor quick solution of problems found in situations of series. The study highlights the emphasis of team A on the efficiency of movements, correct execution of movements in a progressive and individualized way.

Concerning the Ecological Field Complexity, interpersonal relationships were homogeneous in both teams, since the coaches' behavior was almost always to start the situations, and the athletes' behavior was always congruent. These data confirm the hierarchical roles that are developed in the RG context, where the coaches tried to take control over all situations in the teaching-learning-training process.

Despite the coaches demonstrating full control of training sessions, in the A team there was also a constant concern with the feedback provided by the athletes. Moreover, very few times such an action was noted team B, except in the training activities of the series with music, which demonstrated negative feedback in the learning process. The athletes trained their staff in this series without the accompaniment of the coach, resulting in the execution and automation of incorrect movements, which invalidated the effects of feedback.

Regarding the conduct of athletes, it can be seen that, although they always shared the same space, as it occurs in team sports training, the activities developed are highly individualized, because few activities that establish interaction between them were noticed.

In summary, with respect to the teaching-learning-training process, the evidence seems to confirm the use of a methodological approach in RG teaching founded on notions of exercise progression, through the refinement and application of the technique. On the other hand, it has also become evident that interpersonal relationships that go through the training programs need to be re-evaluated, especially regarding the rigidity of the sessions and the lack of communication between coaches and athletes.

Finally, it is necessary to conduct more studies of this nature in other RG categories, in order to demonstrate more fully the various ways of structuring the teaching-learning-training process of the modality, and to assist in the performance of teachers/coaches, as well as in the initial and ongoing training of these professionals.

REFERENCES

Alonso, H. (2004). Meu corpo, minha cultura, minha ginástica rítmica. *Anais do 3º Congresso Científico Latino Americano de Educação Física da Unimep.* Piracicaba. Universidade Medotista de Piracicaba. pp. 438-443.

Bronfenbrenner, U. (1979). Contexts of Child Rearing: Problems and Prospects. *American Psychologist.* **34:** 844-850.

Bronfenbrenner, U. (1996). *A ecologia do desenvolvimento humano: experimentos naturais e planejados.* Tradução M. A. Verríssimo. Artes Médicas. Porto Alegre.

Bronfenbrenner, U. (1992). Six Theories of Child development: Revised Formulations and Current Issues. Vasta, R. (Ed.) *Ecological Systems Theory* (pp. 187-243). London: Jéssica Kingsley Publishers.

Caçola, P. (2005). *Comparação entre as práticas em partes e como um todo e a utilização de dicas na aprendizagem motora de duas habilidades da GR.* Dissertação de Mestrado em Comportamento Motor. Programa de Mestrado em Exercício e Esporte - Universidade Federal do Paraná. Curitiba.

Carreiro da Costa, F. (1986). *O sucesso pedagógico em Educação Física: estudo das condições e fatores de ensino-aprendizagem associados ao êxito numa unidade de ensino.* Tese de doutorado. Faculdade de Motricidade Humana - Instituto Superior de Educação Física. Lisboa.

Chiviacowsky, S. & Godinho, M. (1997). Aprendizagem de habilidades motoras em crianças: algumas diferenças na capacidades de processar informações. *Boletim da Sociedade Portuguesa de Educação Física.* **15:** 39-47.

Corrêa, U.C., Martel, V.S.A., Barros, J.C. & Walter, C. (2005). Efeitos da freqüência de conhecimento de performance na aprendizagem de habilidades motoras. *Revista Brasileira de Educação Física e Esporte.* **19:** 127-41.

Crause, I.I. (1985). *Ginástica Rítmica Desportiva: um estudo sobre a relevância da preparação técnica de base na formação da ginasta.* Dissertação de Mestrado em Educação Física. Universidade Federal do Rio de Janeiro. Rio de Janeiro.

Freire, J. B. (2003). *Pedagogia do Futebol*. 1ª ed. Editora Autores Associados. Campinas.

Freire, J.B. & Scaglia, A.J. (2003). *Educação como prática corporal.* 1ª ed. Editora Scipione. São Paulo.

Haddad, L. (1997). *A Ecologia da Educação Infantil: construindo um modelo de sistema unificado de cuidado e educação.* Tese de Doutorado. Faculdade de Educação - Universidade de São Paulo. São Paulo. 336 pp.

Krebs, R.J. (1993). Teoria da Especialização Motora. Anais *8th World Congress Sport Psichology*. Lisboa. Faculdade de Lisboa. pp. 679-682.

Krebs, R.J. (1995). *Desenvolvimento humano: teorias e estudos.* 1ª ed. Casa Editorial. Santa Maria.

Marques, A.T. (1997). A preparação desportiva de crianças e jovens. O sistema de competições. Guedes, O. (Org). *Atividade física: uma abordagem multidimensional.* (pp. 157-169). João Pessoa: Idéia.

Marques, A.T. (2001). O treino dos jovens desportistas. Atualizações de alguns temas que fazem a agenda do debate sobre a preparação dos mais jovens. *Revista Portuguesa de Ciências do Desporto.* **1:** 30-37.

Martins, E. & Szymanski, H. (2004). A Abordagem Ecológica de Urie Bronfenbrenner em Estudos com Famílias. *Estudos e Pesquisas em Psicologia.* **4:** 63-77.

Mesquita, I. (1997). *Pedagogia do Treino: A Formação em Jogos Desportivos Coletivos.* Livros Horizonte. Lisboa.

Moreira, V.J.P. (2005). Estruturação dos treinos segundo o processo metodológico de ensino-aprendizagem-treinamento nas categorias de base do futsal. *Revista Mineira de Educação Física.* **2:** 457-465.

Nascimento, J.V. (2003). *Processo de ensino-aprendizagem-treinamento do Voleibol em crianças e jovens: uma*

abordagem ecológica. Trabalho não publicado. Projeto de Pesquisa – Laboratório de Pedagogia do Esporte (LAPE). Universidade Federal de Santa Catarina.

Nascimento, J.V. & Barbosa, G.B. (2000). Estruturação das sessões técnico-táticas no voleibol infanto-juvenil e juvenil feminino: um estudo de caso. *19º Anais do Simpósio Nacional de Educação Física.* Pelotas. pp. 149-156.

Nísta-Piccolo, V.L. (1999). *Pedagogia dos esportes.* 4ª ed. Editora Papirus. Campinas.

Oliveira, J.C. (2002). *O ensino do basquetebol: gerir o presente, ganhar o futuro.* Editora Caminhos. Lisboa.

Paes, R.R. (1996). *Educação Física escolar: o esporte como conteúdo pedagógico no ensino fundamental.* Tese de Doutorado. Faculdade de Educação Física - Universidade Estadual de Campinas. Campinas. 206 pp.

Pereira, S.A.M. (1999). *GRD: aprendendo passo a passo.* Editora Shape. Rio de janeiro.

Saad, M.A. e Nascimento, J.V. (2003). Processo de ensino-aprendizagem-treinamento nos escalões de formação do futsal. *Anais do I Congresso Internacional de Pedagogia do Esporte.* **1:** 50-60.

Silva, T.J. (2004). *Processo de ensino-aprendizagem-treinamento no voleibol: um estudo de caso da categoria mirim.* Monografia de Graduação. Licenciatura em Educação Física - Universidade Federal de Santa Catarina. Florianópolis.

Stefanello, J.M.F. *A participação da criança no desporto competitivo: uma tentativa de operacionalização e verificação empírica da proposta teórica de Urie Bronfenbrenner.* Tese de Doutorado. Faculdade de Ciências do Desporto e de Educação Física - Universidade de Coimbra. Coimbra. 232 pp.

Vieira, L.F. *O Processo de desenvolvimento de talentos paranaenses do atletismo: um estudo orientado pela Teoria dos Sistemas Ecológicos.* Tese de Doutorado. Universidade Federal de Santa Maria. Santa Maria, 181 pp.

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