

# **A METHODOLOGICAL THEORETICAL CONCEPTION OF THE PHYSICAL CONDITION CONTEXTUALIZED IN THE PHYSICAL REQUIREMENT OF COMPETITION IN HIGH-PERFORMANCE YOUTH CHESS**

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## **Abstract**

The theoretical methodological conception of the physical condition contextualized in the physical requirement of competition in high-performance youth chess offers a solution to the problem related to insufficiencies in the integral diagnosis of high-performance youth chess players, which must identify and substantiate the integrating contents of the specific physical preparation; the procedures and indicators to determine the loads they receive during training and competition in a seated position; and the didactic treatment to the symptoms of fatigue during the game and competition, which limit competitive performance. It was based on the elements of judgments provided by the records of practical systematization, materialized with experienced coaches and athletes, reports of research projects, degree theses and reports of meetings held in the management bodies and technical collectives of coaches, and the diagnosis of the chess players of the youth team of the EIDE "Carlos Leyva Gonzalez" in the province of Las Tunas. The proposal establishes the relations between the theoretical, methodological and functional subsystems, which favour the identification of contents and means; the treatment of physical performance factors, as well as the contextualised planning and execution of its components, in order to achieve an integrated management of physical preparation. **This article is the result of a doctoral thesis.**

**Key** words: Chess, youth, high performance, theoretical methodological conception, physical condition

The majority of the scientific community of Chess agrees that in the preparation of high performance youth chess players, at least the theoretical-practical, psychological and physical components must be present; the game is eminently intellectual, where the processes of reasoning, memory, concentration, decision making, among others, are closely related to the psyche, but the physical component seems very little related to activity, since both preparation and

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tournaments take place in the seated position. But precisely the same, with the prolongation of the games from two to three hours and the tournaments from five to seven days, cause a fatigue that one of the ways to counteract it is the physical preparation.

The results do not always meet expectations, which leads to the constant search for new forms of integral preparation with emphasis on the contextualization of the contents of physical preparation, a criterion corroborated in elements of judgments provided by the registers of practical systematization; materialized with the experienced coaches and athletes, the reports of research projects, degree theses and reports of meetings carried out in the management bodies and technical collectives of coaches, and the results of the diagnosis implemented in the preparation process of the high-performance youth players of the School of Sports Initiation (EIDE) "Carlos Leyva Gonzalez" of Las Tunas, allowed to corroborate the following manifestations of insufficiencies in:

- The integral diagnosis, which must identify and base the integrating contents of specific physical preparation of the game of Chess.
- The procedures and indicators to determine the loads that the chess player receives during training and competition in a seated position.
- The didactic treatment to the symptoms of fatigue during the development of the game and its competition calendar.

The results of the evaluative, critical and reflective analysis concerning the causal epistemological assessments and the teacher-researcher's own experience, are an expression of the **contradiction** established between the didactic orientation of the contents of the physical preparation, and the internal logic of the physical performance factors that are assumed for their practical concretion, which does not consider the diversity of anatomical-physiological components committed to the stability of the performance during the competition.

Such contradictions of the theoretical context, confirmed in the Program of Integral Preparation of the Athlete, and the theory that sustains it, as well as, results of doctor thesis.

Such contradictions of the theoretical context, confirmed in the Program of Integral Preparation of the Sportsman, and the theory that sustains it, as well as, results of doctoral theses that in particular have approached the physical preparation, allow to specify the scientific **problem** that consists in: How to harness the physical condition identified with the physical exigencies of the formative and competitive dynamics of the youth chess of high performance? The development of the contents in the execution of the physical preparation

assures the exclusive physical demands of the internal conditions in the organism of the chess player. This is why the physical preparation process of high-performance chess players is required as an object of study.

In order to determine the field of action we start from the systematization of the process of physical preparation, from the abstract to the concrete, whose results reveal, within the dimensions that structure this process, shortcomings in the didactic orientation of the contents of physical preparation, hence the field of action is needed: the direction of the contents and the means of the physical condition in the formative and competitive dynamics of high-performance youth chess.

It is defined as a research **objective**: to elaborate a theoretical methodological conception integrating physical performance factors, in order to strengthen the physical condition of high-performance youth chess players.

The theoretical methodological conception, starts from the logic of the process of physical preparation of the youth chess players of high performance by means of the components that gravitate in them, composed by three subsystems with their respective components and subcomponents.

The epistemological support of the theoretical methodological conception, is instituted from considering the contextualized physical preparation and within it the integrative systematization in the dynamics of the physical activity, as the axis and center of the cycle of integral development, that makes reference the Integral Program of Preparation of the Athlete, with emphasis in the youth chess players of high performance, while it is dynamized in the dialectic relation that is established between the components and sub-components of the subsystems that structure the theoretical methodological conception.

Likewise, the results of the dialectical relationship between the theoretical and methodological foundations of the subsystems, are submitted to an exercise of integrative systematization, category that manifests the dialectical character in the system of relations and contradictory that are revealed, and by the projection of the qualitative changes in the object through the transforming capacity of the diversity of explanations and solutions, to the ways of treating and resolving the physical demands that underlie the muscular profiles affected by prolonged isometric loads in the formative and competition context of the high performance youth chess players.

The theoretical subsystem represents the psychopedagogical foundations, on which the contents and means are based; special exercises, of the physical preparation identified with the physical requirements of the high-performance youth chess, the indicators and criteria of measures for the integral diagnosis, as well as, the foundations that reveal the types of physical capacity and

muscular contractions that are revealed in the muscular profiles committed to the seated position during the development of the games.

It is conceived as a first step of the theoretical methodological conception, to evaluate the state of the physical condition of the chess players taking as reference the indicators that will be taken into account, in the different moments of verification of the aspects that configure the factors of physical performance, to which the diagnosis will be made.

This implies aerobic physical capacity, as well as muscular strength and endurance in the muscular profiles that intervene in the seated position from the moment it is recognized as a process of categorical integration that is concretized in the dialectic that is established between the components: previous analysis, the integral diagnosis and the characterization of the loads in the seated position, structured by their arguments.

By nature, fundamentally physiological and of psychological impact that have the chess players, the physical loads caused by the extensive games. It arises the need to deepen in the previous analysis of the models of planning and the theory in which they have been sustained, qualitative aspect of vital importance in the verification of the results of the integral diagnosis that, among other factors, takes care of the expectations of the forms of the contents that characterize the physical condition demanded by the concrete physical demands that imposes the formative exercise and of the competition in the youth chess of high performance.

The previous analysis is defined as: the process of characterization of the convenience of the previous training and of the context in which the next stage of physical preparation of the chess players has to be developed. Its main functions are to examine and evaluate the effects of the previous macro-cycle, concerning the relevance of the physical preparation programmes and the preceding level of physical condition of the players and, likewise, its comparison with the particularities and requirements of the physical preparation that is planned to be carried out (Chart 1).

The integral diagnosis, on the other hand, allows to obtain the elements of judgments that, with precision, characterize the current level of development of the physical condition of the chess players, as well as the congruence of the foundations of the theory of physical preparation and the theoretical-practical knowledge of the trainers to achieve the aspiration to reach.

For this reason, this component requires to be conformed by subcomponents that dynamize it, among which stand out: tests of knowledge to the trainers and of behavior of the physical condition subordinated to the indicators and criteria of measures, shared with the previous analysis, precisely, identified with factors of physical performance: the aerobic resistance of average and long duration,

as well as, the muscular strength and resistance; isometric in the context of the muscular profiles, determinants in the physical condition for the competition of Chess.

The characterization of seated loads, based on the theoretical positions of Román (2010), Matveev (1983), Harre (1988) and López y Fernández (2006) concerning the definition of the nature of long-term aerobic endurance, muscular endurance and strength and the types of muscular contractions within which isometrics are assumed.

About the component characterization of the loads in the seated position, it is pertinent to stop at the term, seated position. The seated position is one of the most recurrent postures of the human being; it is commonly known as "seated position". M. Médichi (2018). Hence, it is assumed to be more comfortable for editorial links.

Such position, evidently, adopted by the chess players during the time they occupy the games, is the frame of reference where the results of the previous analysis and the current state of the physical condition of the players are detected to a greater extent, but the most important thing to characterize are the types of loads, muscular contractions and the muscular profiles that support them, inasmuch as they allow the singularity of the means (special physical exercises) and the forms of specifying them associated with the physical capacity to train to be identified with precision.

In this case, we propose physical exercises identified with the muscles that intervene in the seated position, dynamized by mainly isometric contractions; identified with aerobic resistance, muscular strength and endurance, dosed and directed by means of forms of organization and execution approximated to the circumstances in which the competition takes place. It is also based on the singularity of the dimensions, the indicators and measurement criteria, as well as the management and control procedures that allow to specify the current state, concerning the determining factors in the ideal physical condition of the players, as well as the potential for further development.

The interaction of the theoretical foundations corresponding to the components: previous analysis, the integral diagnosis and the characterization of the seated loads emanating from the integrative systematization, emerges as a new quality of the theoretical subsystem: the identification of the contents and the means, for the development of contextualized physical condition in the formative and competitive process of the chess players, divided into personal and non-personal.

The non-personal ones are located in the concepts: aerobic endurance, muscular strength, muscular endurance, flexibility and joint mobility. On the other hand, within the personal ones are the work capacities: aerobic

resistance, muscular strength and resistance, flexibility and joint mobility, as well as the muscular profiles committed to the seated position and the loads that, in movement and isometrics, must receive with the required pertinence.

In the proposal, basic gymnastics will be used within disciplines related to physical preparation, because it offers the contents, means, and methods, procedures, oriented to the fulfillment of development parameters of the physical condition subordinated to the aerobic energetic system.

This makes it clear that, in order to achieve this, it is necessary to deepen the didactic principles of sports training, which leads to the search for the fundamentals through interaction with the dynamics of the components of physical training management and personalized didactic management in the methodological subsystem, orientation of the method and the ways of using the new quality, identification of the contents through the singularity of the means (special physical exercises).

The methodological subsystem, structured by the components: contextualization of the didactic principles; direction of physical training, and personalized didactic management, express the actions of investigation and precision of the theoretical and methodological foundations that must be fulfilled in the practical direction-concretion of the didactic components of the contextualized physical preparation process.

For the contextualization of the didactic principles of the theoretical methodological conception, we start from the fundamentals of the didactic principles of sports training presented by L. Matveev (1983). From this position, the contextualization of the didactic principles is materialized, starting from considering the theoretical and practical foundations of the level of relationship established between the sub-components that structure them.

On the basis of the foundations outlined, the contextualization of the didactic principles consists of: guiding instruments of the practical direction-concretion of the physical preparation process, respecting the particularities of the objective, emanating from the integral diagnosis and its interdependent relation with the content, the necessity of the concrete physical capacity of the chess players and the method for its concretion, criterion that confirms the necessity to assume the didactic principles:

- Dialectical unity between the theory of the fundamentals of physical preparation and the demands of the real physical demands of the factors of physical performance during the development of the prolonged games in seated position.
- Cyclic nature of the physical preparation process.
- Gradual and progressive increase of loads.

- Control of the dosage between the structures of external and internal loads.
- Affordability and individualization.
- Quantitative and qualitative evaluation of results.

Once achieved the arguments corresponding to the contextualization of the didactic principles, it is indispensable to make a study of the energetic systems to assume the direction of physical training that adjusts to the expectations of the direction of the same one that requires the contextualized physical preparation that is based on the theoretical methodological conception defined as: process by means of which the chess players obtain the physical condition established by factors of physical performance, related to the physical demands of the formative process and of competition of the Chess.

In this regard, it was necessary to assess the fundamentals of the three energy systems that provide muscles with energy to maintain certain efforts of intense work:

- The alactate or alactate anaerobic energy system does not require oxygen, uses the energy stored in the cell as fuel, does not produce lactic acid and is the main source of energy for the activity that lasts up to 10 seconds with maximum intensity.
- The anaerobic lactic or lactacid energy system that does not require oxygen, uses carbohydrates as fuel, produces lactic acid and is the main source of energy for activities that last between 11 seconds and 2 minutes with an intensity close to maximum.
- The aerobic energy system needs oxygen, uses fats and carbohydrates as fuel, does not produce lactic acid and is the main source of energy for activities lasting more than 2 minutes with a medium or low intensity.

The evaluative, comparative and critical analysis of the three energetic systems, taking as reference the particularities of the physical demands demanded by the prolonged games of Chess in sitting position, makes clear that, from the arguments emanated in the interaction with the component: physical training direction, the aerobic energetic system is declared, because it is the main source of energy for activities that last more than 2 minutes with a medium or low intensity, very identified with the energetic demands that the competition in the youth chess of high performance requires.

However, putting into practice the perspectives of the previous components requires personalized didactic management, which, starting from taking into account the elements of judgments emanating from the previous analysis and the integral diagnosis, preceded by the contextualized didactic principles and the direction of aerobic physical training, manages the specific didactic

foundations of the objectives, contents, methods and particular dynamizing procedures of the preparation stages, as well as the types of physical exercises, orientations and methodological indications for the distribution and dosage of the loads and the structure of the training sessions, as appropriate.

In this respect, the emphasis is on the deepening of the objective component. R. Álvarez de Zayas (1997), concerning its guiding character in order to achieve the aspirations and purposes of the theoretical methodological conception of physical preparation. This means that the objective is a category and when the other components are subordinated to it, they become the law of didactics.

Placing these criteria, in the context of physical preparation, it is necessary to assume them, because they reinforce the defense and practical concretion of the singularity of the components that are subordinated to it, precisely, related to the contextualization of the contents of the physical preparation, the forms and the strategies of personalized direction of the same ones.

In line with the previous idea, it must be emphasized in the integrating character of the determinant contents in the singularity of the contextualized physical preparation of the chess players, sustained in theoretical positions of Román (2010), Matveev (1983), Harre (1988), López and Fernández (2006) and Ruiz Aguilera (1985) about the characterization that they do of the physical capacities, the types of force and muscular contractions, respectively.

Concerning the force, the mentioned authors agree that it is "the increase of the tonicity of a muscle, caused by a nervous stimulus, that makes possible the movement or the maintenance of a position of a muscular plane".

Resistance to muscular strength: is the ability of the body to resist fatigue during a relatively long-lasting performance of strength. Ranzola and Barrios (1998). For both types of forces, one's own body weight or that of a partner, implements and elastic devices are used as fundamental means.

On the other hand, the work for the force as content, is developed preferably by means of isotonic actions and for the resistance to the force, the isometrics, by means of work relations and rest of 1:1 and 2:1. It is significant to point out that exercise as a fundamental means moves intentionally through the muscular profiles affected by the seated position adopted by the chess players in prolonged time; therefore, they are physical activities identified with the physical demands of the formative process and of the competition of high-performance youth chess.

Similarly for work aimed at the development of aerobic endurance are established:

- Different variants of races; preferably continuous.

- Auxiliary sports with a dosage oriented to meet aerobic endurance parameters.
- Dance therapy or other dance variant.

On the other hand, the flexibility, another physical capacity for the good performance of the chess players: it consists in the capacity of mobilization of an articulation or joint, as well as the possibility of closing or opening for the cinergético work. Flexibility manifests itself externally in the amplitude of the joint closure or opening admitted by the joint structure.

The contents and the means are like dialectical pairs that have the function of providing the special physical exercises that determine the physical condition required by the chess players, due to the importance of the synergy between the demands of the contents and the means, with the awareness of the need to assimilate them. These contents and means are: aerobic resistance with different variants, strength and muscular resistance located in the muscular profiles, as far as the content and the specific way of executing them are concerned.

To assume such criteria is a necessity for the pertinent methodological work of the trainers with respect to the application of the contents, according to the real possibilities and potentialities of the chess players, base and starting point for the distribution, dosage and control of the physical loads, action that is modelled, assuming the physical condition as a contextualized reference variable. It is defined as the set of physical and morphological qualities, which are manifested in the capacity of the chess players to perform and resist physical and intellectual tasks during training and competition, at the rate of economic and advantageous efforts for the chess player, base and starting point for the distribution, dosage and control of physical loads, action that is modeled, assuming the physical condition as a contextualized reference variable. It is defined as the set of physical and morphological qualities, which are manifested in the ability of chess players to perform and resist physical and intellectual tasks during training and competition, at the rate of economic efforts and advantageous for physical and mental health.

It is in the systematization between the three components, mediated by personalized didactic management, that the quality of the didactic treatment to the factors of physical performance emerges, as a process of socialization of the personal and non-personal didactic components for the sake of the consolidation of the knowledge on the systematic and progressive integration of the methodological indications for the planning and transforming projection of the physical preparation in the training sessions based on the principle of affordability and individualization.

The didactic treatment of physical performance factors is defined as the integrating axis in the methodological dynamics of the concepts that define the contents of physical preparation, closely linked to the requirements of the aerobic work capacity of the chess players, the strength and endurance of the gluteal, lumbar, abdominal, dorsal and cervical muscles committed to the resistance to prolonged isometric loads during the development of the games.

The proposal makes clear the orientation of the types of exercises and the dosage of the loads located in the morphological elements that structure the factors of physical performance, the arguments and the epistemological path for the selection of the special physical exercises and the way to apply the loads corresponding to the assumed physical capacities, which must be subordinated to the fundamentals of the aerobic direction of physical training.

In this sense, the pertinent distribution and dosage of the loads plays a preponderant role: therefore, it is necessary to proceed to materialize the dialectic relationship with the functional subsystem, structured precisely by the components: socialized understanding of the objective, distribution and dosage of the loads and the dynamics of control and evaluation.

The object and foundation of the component: socialized understanding of the objective, is based on the didactic requirements active, conscious and protagonist participation of the chess players in the direction of the process from its initial conception, to the analysis of the final results and concerning that, the dynamics of the physical preparation session, must imprint a culture that is manifested in the conscious interest that it will serve him for something in the future. B. Jeffers (2004) is also based on the principle of activity awareness. Ruiz Aguilera (1985).

The theoretical and methodological foundations of sports training planning are assumed, presented by Matveev (1983), Verjoshanski (1990), Grosser and Bruggeman (1990), Platonov (1998), García (1996), Weineck (2005), Collazo (2006), Romero (2006), Morales (2011), Heredia (2012), since they reveal the need to develop training in phases and also the distribution and dosage of loads, without ignoring the fundamental components that make up planning.

The distribution and dosage component of the physical loads, systematized in the methodological subsystem, is defined as the process where the regulation of the physical work of the chess players takes place in each temporal structure, in correspondence with the interconnection of the physical capacities associated to the innovation of contents and the means presented in the theoretical methodological conception.

The distribution and dosage of physical loads, is conceived as the concept mediator between the physiological influence produced by external loads and internal loads, is projected on the basis of the vision that one has concerning

the objectives, of the initial state of the physical condition of each particular chess player, identified in the foundations of the integral diagnostic components and the previous analysis, located in the theoretical subsystem.

It is indispensable for a pertinent distribution and dosage of the loads, the interaction with the foundations of the component: dynamics of control and constant evaluation of the process of physical preparation, the same one contributes the elements of feedback judgments of the evolution of the physical preparation, inasmuch as, it contributes the analytical, evaluative and critical exercise of reference, about how the process behaves, which are the strengths and weaknesses, so that the activities can be reconsidered as it is convenient, it is integrated to the dialectic relation between the components: socialized understanding of the objective and the distribution of the physical preparation, the same one contributes the elements of feedback judgments of the evolution of the physical preparation, inasmuch as, it contributes the analytical, evaluative and critical exercise of reference, about how the process behaves, which are the strengths and weaknesses, so that the activities can be reconsidered as it is convenient, it is integrated to the dialectic relation between the components: socialized understanding of the objective and the distribution of the physical preparation.

The dynamics of control and evaluation, based on the theoretical methodological conception, is defined as: the function of scientific direction directed to the recording, verification and evaluation of the results during the process of physical preparation and in the competition, by means of the application of procedures, indicators and criteria of measures, identified with the particularities of the factors of physical performance defined in the theoretical methodological conception.

As forms of control, the criteria established by Zapazharov (1998), cited in Zatsiorski's work (1989), are partially assumed, who determine three forms of control: by stages, current and operative. The control by stages is used to determine the fulfillment of the objectives (general) at the end of the mesocycles or macrocycles.

Current control encompasses the (partial) objectives and contents (physical capabilities) of the microcycle. Operational control includes the (specific) objectives and content (exercise or task) of the training session. In each form of control, the dialectical relationship between load, state, and performance, where the load is the cause of the state, and the state, in turn, is the cause of the performance, must be considered. A. Morales (2002)

Precisely, planning is key, because it is necessarily where actions are defined for the realization of objectives through the manipulation of content and media, through methods that require the nature of physical activity to develop during physical preparation. The actions of this subcomponent should be initiated by

the systematic attention and control of the fundamentals of the socialized understanding component of the objective, established with the high-performance youth players.

During the execution of the planning, it is also transcendent the verification of the temporal structuring of the preparation period, to have clarity of the available time, in such a way that it can be distributed in the different structures, from the macrocycle, mesocycle, microcycle and session of physical preparation.

However, in spite of the pertinence of the referred planning models, a proposal of dosed planning in three stages is also conceived, divided in quarters subordinated to indicators and criteria of measures derived from the current situation of the physical condition of each chess player, which does not constitute a pattern, this must be flexible, so that, according to the demand of the competitive calendars and the volume of time that occupy the theoretical-practical and psychological preparation, the model of training or program of physical preparation that each trainer decides to assume adjusts.

In particular, physical preparation is one of the components of the sports training process which, from a structural point of view, does not differ generically from the training unit; therefore, in the theoretical methodological conception, the planning structure is divided into three moments: introductory, increasing volume; main, greater intensity and final, decreasing intensity.

As has been seen, the contextualized physical preparation session that is assumed is presented as a complex process from the organizational point of view, decisive in the planning, execution and control, because they have to be tempered to the particularities of the isometric loads emanated in the circumstances in which the game takes place and of the dynamics of the contents in the transit from the preparation process to the high performance competition.

Once the arguments presented and subsequently processed by means of the integrative systematization have been obtained, the resulting quality is achieved: the contextualized planning and execution of the components of the physical preparation, for which the precision of essential aspects to be considered is decisive, starting from the foundations of the quality: innovation of the contents and the level of compatibility of the loads, with the real possibilities and potentialities of physical condition of the chess players.

Finally, from the integrative systematization of the dialectic relation between the theoretical, methodological and functional subsystems, the theoretical foundations of the theoretical methodological conception of integrative physical condition are constructed and specified in the high performance youth Chess

that connotes the epistemological richness of the dimension: integrative and contextualized direction of the components of the physical preparation aimed at high-performance youth players.

The integrative and contextualized management of the components of physical preparation aimed at high-performance youth players, lays the epistemological and practical foundations, committed to the improvement of physical preparation; they allow, through a methodology, to establish physical preparation strategies based on the dynamics implanted by the innovation of contents and well-founded means.

## Conclusions

1. The establishment of coordination and subordination relations between the components of the theoretical, methodological and functional subsystems, and their internal logic that define the theoretical methodological conception that integrates physical performance factors, in order to achieve an integrative and contextualized management of physical preparation in high-performance youth chess players.

2. The theoretical methodological conception integrating the factors of physical performance of the formative process and of competition in Chess, will be put into practice through a methodology, which must be distinguished by its flexible character, as well as a dynamic in the establishment of the dialectical relations that occur between the subsystems, components and stages, which are directed to assume the factors of physical performance as an integrating axis of the dynamic of the contents and means of physical preparation in the context of reference.

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Chart 1. Relationship between the particularities of Chess and the content of physical preparation

Chess particularities	Content of physical preparation
<ul style="list-style-type: none"> <li>• Total duration of the classic game from 1.5-3 hours</li> <li>• 5-15 day event extension</li> <li>• Predominantly intellectual work, activity where the aerobic energy system prevails, and blood glucose is the main fuel of brain tissue</li> </ul>	Aerobic resistance
<p>The main muscular planes that intervene in the position adopted by high-performance chess players (both in the theoretical-practical and competitive preparation process), by the time they remain in a static position, although there is no shortening or lengthening of the muscular fibres, generate a tension, considered a static isometric contraction.</p>	Resistance to force
<p>The last five minutes of the time controls (there can be two or even three) are played at a very fast pace, where there must be coordination between the actions to be performed, with the movement of the piece without knocking over the others, because it loses time in arranging them as established, mark in some way the number of moves and also activate the clock finally, to consider the complete move. Fast chess (duration of the game between 15 and 60 minutes) and lightning (less</p>	Anaerobic endurance, speed and coordination

than 15 minutes), although they are modalities of the sport, are frequently used as means of tiebreaker.	
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