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Motor Coordination and Its Importance in Practicing Performance Movement

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Abstract: The training of good motor coordination optimizes the motor skills, and these, over time, lead to the improvement of the motor skills specific to the practiced movement. The purpose of this study was to assess the capacity and speed of learning coordinated movements in the context of working in an online system. At the same time, we set out to evaluate the level of motor coordination achieved through training using the eLearning platform Hudl and the Teaching Games for Understanding approach. Thus, three groups of students were analyzed whose motor histories were different. The analysis of the three tested groups was performed in the first year of study and in the third year of study. The training programs have been adjusted/modified according to the COVID-19 pandemic situation, which has determined their application in the online system as well. The results of this study confirm that by assisting learning through computer programs, in the online system, these workouts can be effective. At the same time, the study shows us that, in addition to the natural evolution from childhood and adolescence, an advanced form of motor coordination appears, which is installed through the action of learning.

Keywords: eLearning platform; Hudl method; Teaching Games for Understanding method; motor learning; motor coordination; interpretive art; motor performance; sports performance

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1. Introduction

During the COVID-19 pandemic, there has been a real revolution in learning methodology, using multimedia digital means. By analyzing the cognitive process of filtering, associating, and interpreting data and information, distance learning methods were put into practice using the eLearning system [1]. Moreover, the physical activity more and more present in recent years in all age groups [2–6] and their increased dependence on the use of technology because of faster obtention of information and feedback [7] has led to the introduction of digital systems in all areas of learning, physical education and sport being one of the areas where technology is integrated [8].

The implementation of educational technologies in areas focused on learning the performance movement improves the process of evaluation of students by teachers [9] and optimizes the process of teaching specific information [10]. Technology through eLearning platforms has a positive impact on those who learn and/or teach movement [11]. In addition, telephone applications and those that are downloaded on computers, e.g., computer games based on video analysis, stimulate the interest of students in their use of recording and examining in detail the movements during exercises or games they take part in [12].

Thus, the advantages of technology are also materialized in different training programs based on both their classical structure and video analysis. The video analysis took into account the specific activity of athletes, coaches, and performers. According to some authors, there is a possibility that video recordings will change the way of practicing and training their motor activities in all sports [13], while other authors highlight the contribution of video analysis to streamlining the training process by reducing the time required to learn technical sports [14]. The video analysis accessed by the specialists of the fields of physical education and sport, as well as performing arts, areas where movement is constantly used in the practice carried out, guides specialists in their work to optimize the skills necessary for students/athletes/performers but also to assess to what extent the movement has been improved by using the mentioned technology. Studies reflect the positive effects of the use of technology on the psyche [15–17] by creating for students/athletes/interpreters an optimal learning environment of the performance movement because of the association between technology, education, and fun, a combination encountered within the Teaching Games for Understanding (TGFU) educational approach [18].

Most authors consider coordination to be a complex motor quality, an individual skill that involves rapid learning and a capacity to restructure movements performed at high speed and under different conditions, a process under the control of the cerebellum and sense organs [19]. To obtain a high-performance movement from a motor point of view, the coordination process requires three aspects: the speed of elaboration of the correct and precise response, the nature of the information processing and the quality of the information coming from the analyzers [20].

The information developed through the analyzers allows the development of the coordination capacity manifested by the interdependence of the basic components (direction/control, adaptation, and learning) [21]. Coordination, through the correlation between the central nervous system, which projects movement onto the cerebral crust, and the skeletal muscles that perform the movement itself [22], is of particular importance in the development of ability, a predominantly psychomotor quality. The structures of the central nervous system involved in the initiation, speed, direction, amplitude, coordination, and finality of the movements are represented by the cerebellum, the basal nuclei, the motor cerebral crust, the reticulated system, the vestibular apparatus, and the paths of sensitivity, where the basal nuclei are initiators of movement, the cerebellum that is the one that controls the movement [23], and the visual, somatosensorial and motor stimulus is integrated at the level of the parietal cortex [24].

In the field of physical exercise science, specialists say that coordination is the result of proprioceptor stimulation that provides important related information for modulating corticomotor excitability and improving motor function and performance [25,26], while some studies suggest that observing motor actions contributes to an increase in the excitability of cortical motors when learning a motor performance [27].

Coordination is achieved by triggering a motor program developed based on previously assimilated abilities (motor learning), and when presented with a new motor skill, a person learns the new motor program as a set of generalized rules or abstract representations of the basic movement model that can be applied to a variety of contexts [28]. Studies in the field show the importance of neuromuscular coordination in different human movements in general [29] and in learning and developing sports skills, performance movement, because coordination allows movements to be controlled and adjusted in real time to meet performance goals [30,31].

In activities that underlie complex sports, activities such as kicking the ball in football, jumping, services in table tennis and badminton, pivotal activity when throwing a disc, as well as in sports that involve high accuracy, such as archery, and in contact sports such as boxing or martial arts, coordination is essential in the efficient and precise performance movement [32]. In interpretive art, coordination is also very important, since it establishes not only the individual landmarks specific to movements but also the character of the character acting in the scene, while also providing the reason for acting [33]. The level of performance in different branches of sport is dependent on the level of development of neuromuscular coordination. Certain actions, acts of specific skill in sports, predominantly require eye–foot–hand coordination such as the transmission of the ball to the goal; other skills predominantly require hand–eye coordination [34]. Some authors maintain that boys have better coordination and much more precise spatial coordination between the upper limb and the eye compared to girls [35]. Meanwhile, others highlight a better coordination in girls compared to men based on the comparison between the preferred hand and the other hand [29].

It has also been observed that movements involving precision, which require fine coordination, are more strongly genetically determined in women, while movements involving strength and speed are more strongly genetically determined in men, with women having greater coordination than men by 5–10% [36]. Specific information about the fact that women have a higher accuracy in fine movements than men is a controversial topic in scientific research. Women's excellence in motor coordination more than men's is noted in the early stages of life [37] and explains the relationship between age and bone growth. Moreover, with increasing age, the ability to coordinate decreases and a coordinated movement involves control, balance, integrity of neuromuscular elements [38], and motor qualities indispensable in achieving motor performance [39]. A coordinated activity becomes automatic through motor learning processes, although it can also be executed consciously [40]. The literature indicates a close relationship between coordination and balance, speed, agility, and force [30] but also between learning a movement by becoming aware of it to the degree of automatism and improving coordination in terms of speed, agility, force, direction, and reaction time [41]. At the same time, there is no relationship between coordination and resistance [42], and from the point of view of the best age at which it is possible to educate coordination, it is accepted that between 4 and 15 years, the increase in the level of coordination is the highest, given that the capacity of motor learning and spatial orientation evolve between 7 and 15 years, the acoustic and optical reaction capacity evolves between 8 and 10 years, the development of the rhythm reaches a peak around the age of 10, and the balance can be influenced from 8 years to around the age of 12 years [43].

Skills related to coordination are most easily developed between 4 and 6 years [44,45]. However, others have found in children of 3–4 years a similar level of motor acquisitions as in those of 4–6 years [46], and accuracy in movements aimed at the use of small muscles develops rapidly and distinctly at the age of 3–5 years [47]. Coordination is mainly taught by repeatedly practicing motor skills in various conditions, combinations and demands. The more the pupil/athlete masters a larger and more varied motor baggage, the more coordinated and efficient his movements become [48]. Coordination may be improved by a training program specific to the sport practiced or by a system of skill development aimed at developing the expressiveness of the interpreter, provided that the structures involved in transmitting the nervous influx are an integral part. The acquisition of coordination skills allows practitioners (athletes or performers, among others) better qualitative executions specific to the motor activities practiced [34,49].

Considering the previous findings but also the context of the pandemic, we intend to analyze to what extent the motor coordination can be trained through motor learning actions even at the age of a young adult of 20–25 years, when the phases of maximum sensitivity in the development of the coordinative and conditional aspect have been exceeded. At the same time, we want to find out if educational programs based on the use of technology that included observing the action through recordings can improve coordination and contribute to maintaining performance in sports and in interpretive art.

The purpose of the study is also to establish whether the development of neuromuscular coordination in the advanced stage, that of automatism, influences sport and interpretative performance.

The hypotheses of the research are:

H1. *The application of training programs for the development of coordination in the online system contributes to the improvement of sports and interpretive performance, as they can be, thus, adjusted/modified depending on the situation.*

H2. *Motor coordination can be trained/modified by motor learning actions at the young age of 20–25 years.*

H3. *Maintaining a very good level of motor coordination requires a rich motor baggage.*

H4. *Perfecting motor skills at the automation stage improve sporty and interpretive performance.*

2. Materials and Methods

2.1. The research Context and Aim

Starting from the fact that the level of coordination increases proportionally to the number of existing motor skills and to the size of the motor experience to which a person is subjected through training, given the restrictions imposed by the pandemic, in which the entire teaching system has been adapted, adjusted and shaped to cope with the concrete situation with which both students as well as teachers were confronted, we analyzed all the aspects of teaching and learning that determined new planning in addition to the innovative strategies of support in teaching and the development of individual methods of education [50]. These methods considered the integration of information technologies into the process of learning in the short, medium, and long term, at all existing levels of education [51].

In this context, the study was to assess the learning capacity of coordinated movements, to determine the level of motor coordination that can be achieved through online learning and through computer-assisted methods, and to establish the importance of motor coordination in practicing and achieving performance movement.

The methodology applied in order to achieve the aforementioned goal consisted of the use of the Hudl method, through which we analyzed of the movements that are seen/revised in slow motion, and of the Teaching Games for Understanding (TGFU) method based on the processing of computer games [18]. It was the students who recorded the performance exercises, and each of them transmitted the recordings by uploading them to the platform. In this way, it was possible to introduce corrections to improve the execution of the movements.

To assess our statistical hypotheses, we decided to apply the T test to evaluate the statistical difference between groups studied. In the analysis, we include a few indicators of *t*-test (T stat, T critical, and *p* value).

The SmartPls 3.0 software offers many tests that can be used to guarantee a factorial analysis and a coherent interpretation of the data and to assume the results of the research.

Furthermore, we designed a structured equation model (SEM) form by 3 variables: motric, bio, and performance.

The consistency of our model was based on the validation steps such as composite reliability, Cronbachs' alpha, rho_A, AVE, R square, and variance inflation factor.

2.2. Research Process: Sample, Data, Variable, and Hypothesis

To ensure that our hypotheses will be researched, three groups of students have been analyzed, all aged between 20 and 25 years old, whose motor history was different:

- A group of 60 students from the Kinesiotherapy and Special Motricity study program (KSM), who did not practice sports at the performance level but only for pleasure, but who did not have any medical prohibitions for practicing sports, participating in physical education classes in school, and occasionally practicing different sports (clinically healthy).
- A group of 60 students from the Performing Arts (Acting) (PA) study program, who, although they have not practiced movement at a high level, use movement constantly in the activity they carry out and have in their training exercises aimed to develop their coordination.
- A group of 60 students from the Sports and Motor Performance study program (SMP), performance athletes legitimized within a sports club, who participated in at least one National Championship organized in the territory of Romania by the resort federation (practitioners with at least 10 years of experience in the field of sports performance).

Since there are inherent losses in the number of students during the years of study (respectively, for the class of the third year to which we refer: KSM started with 180 students and finished with 153, a loss of 15%; PA started with 98 students and finished with 60, a loss of 38.78%; SMP started with 180 students and finished with 128, a loss of 28.89%), especially in terms of the number of students from the vocational profile (PA and SMP), the tests were first performed on all students of the first year, and in the end, only the values of the tests of those who managed to reach the final year were kept. Additionally, the lowest number of subjects who graduated from the first cycle of studies, i.e., 60 students graduated from PA, were considered for the testing carried out. In this way, an equal number of test subjects was established, which allowed the comparison of the recorded data.

We mention that the students who have reached year III are those who, during the COVID-19 pandemic, for two and a half years have carried out almost their entire learning activity in the online system.

The learning process included training and a variety of practical means. The subjects from the Performing Arts (Acting) (PA) worked in the regime of 4 specific trainings per week, those from Kinesiotherapy and Special Motricity (KSM) worked in the regime of 2 specific trainings per week, and those from Sport and Motor Performance (SMP) had only one coordination training per week, because the specific trainings of the sport they practice predominated.

The practical means used were:

- Changing the different parameters of movement determined by the workspace of each student (here, we include in addition to his own workspace the position of the beginning or end of the movements, the execution tempo, the direction of travel, the variations in dynamics of movements, etc.).
- Hindering the execution of the movement by introducing additional, more static movement sequences to replace the large movements in the workrooms.
- Hindering the movement itself (using elastic bands, balls, weights, or other objects) to more clearly feel the muscles involved in that movement.
- The combination of movements as varied as possible.

The exercises contained various workloads that put the students in situations that would require their command-and-control processes to solve them. The main purpose of the trainings that were carried out on the 3 groups of students during the pandemic was to permanently introduce new, unfamiliar problems, within known actions, which could be carried out individually in front of the computer, each having the opportunity to adapt the program proposed by the teacher to his own skills and working conditions.

The practical courses included oriented topics towards a single motor capacity. This way of working allowed the deepening of each proposed topic, helping the students to better understand what is required of them and at the same time by streamlining the material taught, through the staggered accumulation of notions that allowed the more complex development of coordination [52]. Other ways of working were represented by:

- Exercises for the development of kinesthetic differentiation capacity, called mirror series, puppet play, and body modeling [53], which represent transitions of the body and its segments from one form of movement to another on precisely established routes, shapes, and amplitudes; repetition of a movement with acceleration or deceleration of execution, without losing the precision of technical execution; alternation of movements conducted with sway movements; alternation of movements with high execution speed with the execution of static positions (controlled maintenance of positions); alternation of movement—relaxation; execution of jumping in succession with the scheduled change in the height of the flight phase; working with the simulator with or without viewing the screen from the monitor (showing the route and the correctness of the execution). Mirror series are exercises that are worked in pairs or in groups and consist of imitating the movement of the partner with promptness and fidelity, without coming into direct contact with him, the point of concentration being on the partner. Puppet play is an individual or group exercise which consists of the construction with one's own body of a doll mechanism and the putting of this mechanism in different working situations, the point of concentration being the maintenance of the mechanism of movement invented throughout the duration of the actions. Body modeling is an exercise performed with the help of a partner and consists of obtaining a prompt and unscheduled response to the direct action of a working partner, which, using one or more body segments, gives impulses of movement. In the online system, the third phase of the exercise was resorted to, in which the partner remotely proposes the impulse maneuver, to which it is answered with a recoil movement. The point of concentration was the preservation of the direction of movement imprinted by the partner in the movement elaborated in response. The performance achieved through these specific exercises leads to the improvement of movement accuracy and agility (coordination in speed mode).

- Exercises for developing the ability of spatial orientation known generically as dynamic games, and from these we chose the invisible substance, warming by motionless, and choose a part [54]. These included movement games based on small movements, on different routes, accompanied by turns around the axis, with changes of planes and stops at fixed points; movements executed with the eyes closed; successions of turns with a stop at the signal and/or at a fixed point; and appreciation of the articular angles, distances, height of flight, of the trajectories of movement from one's own execution (watched during the filming made), or in the execution of the colleagues (analyzing their videos). Invisible substance is a series of exercises that are worked on individually, in pairs, or in groups. The invisible substance consists of making movements using as varied dynamics as possible (fast movements, slow movements, stopped movements, jerky movements, etc.) and different shapes (round movements, sharp movements, swaying movements, falls and imbalances, etc.) imagining the space that would allow it to move and that has a different consistency. The moves were made on a soundtrack in accordance with the required dynamics. The point of concentration was the realization of dynamics, with the clear transition from one dynamic to another, at the teacher's indication.
- Warming by motionless (individual exercise) consists of mobilizing a body segment or muscle without involving the movement of the body in space. This tension is achieved at the indication received from the teacher. The point of concentration was the maintenance of a constant tension in the indicated segment. Choose a part consists of dividing the students into subgroups, each subgroup moving with different dynamics, for which it must have a justification (for example, subgroup 1 goes through sand on the beach, subgroup 2 swims in the sea, and subgroup 3 flies). The important thing is that each subgroup reacts as if it were interacting (although the interaction is only visual through the computer) and that everyone keeps their dynamics and does not let themselves be influenced by what they see in their partners. The point of concentration was the preservation of movement dynamics. The performance achieved through these exercises was reflected in the development of reaction speed and active mobility.
- Exercises for the development of the capacity of temporal orientation generically titled rhythmic games, based on synchronizing the sequences of movements and repeating them at the same pace, increasing the rhythm or decreasing it and integrating successions of motion structures into the music. Rhythmic games are exercises that are worked individually, in pairs, or in groups and consist of the realization of motor skills (walking, running, jumping, pulling, hitting, or pushing), optionally accompanied by noises, at the instructions of the teacher or a group leader who imprints the rhythm of execution of the movements. One of the working variants used is the following: on a sound background, the rhythm of the song is taken, and the movement is transmitted from one body segment to another, without losing the imposed rhythm. The point of concentration was maintaining the imposed pace or entering with complementary rhythms above the basic rhythm.

- Exercises for the development of the equilibrium capacity, which, in the area of theatrical pedagogy, are called part of a whole, three changes, juggling with large objects, physicality of an object, and exercises of category application routes [55]. These include various displacements, with the use of motor skills and the maintenance of some positions permanently modifying the conditions of execution (decreasing or increasing the support surface, increasing the mobility of the support surface, and changing the height of the center of gravity relative to the support surface); maintaining equilibrium positions; moving from one equilibrium position to another equilibrium position without intermediaries steps; execution of turns or acrobatic movements (rolls, upheavals, boards in different directions, etc.) completed by steady movements with support on one leg or another body part; executing movements or maintaining steady positions without visual cues (with your eyes closed). Part of a whole consists of constructing from the students' bodies a mechanism that must be set in motion. It can start from anything: machines, abstract mechanisms, constellations in the universe, statuary groups, a flower, an animal, or the cells of the human body. The difficulty was remote collaboration and synchronization without physical interaction. The point of concentration was to keep the mechanism in balance and its functioning through synchronization with colleagues. Three changes are an individual exercise that consists of using an empty container (a bottle, glass, bucket, etc.) filled with water (or sand) and working with the object in its absence. Different actions are done that are repeated three times in the three variants listed above. The point of focus was establishing the weight of the object and how the existence of this object influences the movement.

Juggling with large objects consists of handling objects (wooden modules, chairs, balls, etc.) while having a moving or changing level action. The point of concentration was on the physical relationship with the object. The physicality of an object consists of trying to bring the object to life, to make it move with you, without the executing student losing their balance and without the object falling out. The point of concentration was on the movement of the object in equilibrium. The mentioned balance exercises optimize the posture with major influence on a good coordination.

The three distinct groups of young people (performance athletes, budding actors, and young people who practice sports only for recreation) were initially evaluated at the beginning of the first year of study and were finally evaluated in the middle of the third year of study, after a period of two and a half years of online learning.

In analyzing the data, we considered as performance indicators, both for SMP and for PA, the specific activity they have carried out at national and international level as well as the level of results obtained by the subjects of our study at these competitions. Thus, for SMP, in the evaluation at the national level, the small-scale regional competitions and the national championships organized by the resort federations for the sports that the subjects practice were considered, and for the international evaluation, the participations in world cup stages, the European and world championships were considered. The sports group from SMP is made up of 27 subjects who practice sports games (football, handball, volleyball, and basketball), 9 subjects who practice the expressive sport of dance and gymnastics, 4 subjects who are athletes, 14 subjects who practice contact sports in the martial arts category, 4 subjects who practice water sports, and 2 subjects who do not practice sports at a high-performance level.

For PA, in the evaluation (which is related to individual or group participation) at the national level, the student competitions and festivals were considered (The National University of Theater and Cinematography Graduates Gala, Young Actor's Gala and CineMAiubit, and Stefan Iordache National Youth Theatre Festival), and at the international level the participation in the Cannes Film Festival and Danil Chirpansky International Student Theater Festival from Stara Zagora.

The testing conducted aimed to establish the response variables in terms of detecting the general coordination that manifests itself according to the motor activity in which the subjects targeted by us are involved. In this study, coordination was treated as an aptitude trait that allows skillful movements to be performed, in the sense of being technically correct and quickly executed [27].

The coordination evaluation was achieved through a verification test (test type) consisting of 8 movements of the upper limbs, which monitored the reaction speed and the elaboration of the motor scheme at cortical level of the tested subjects. The test forced the subjects to coordinate the movements of their upper limbs safely and economically in the given situation, forcing them to adapt and learn relatively quickly the imposed movements. In view of the multiple and diverse use of the upper limbs, the testing carried out was aimed at highlighting their ability to coordinate, given that skill and dexterity manifest themselves as a means of coordination primarily in manual gestures [56].

The motor coordination test used aimed to evaluate the general coordination, because of learning some movements that are found in different areas of daily life.

The applied coordination test is one developed by us based on the requirements imposed by the methodology of formation of the tests, a methodology that claims that through the test performed, the tested subjects must be able to give a minimum response to the test [57].

Evaluating coordination is a difficult task, due to its complexity and manifestation in extremely different situations. In this context, the analytical boarding of coordination evaluation is incapable of capturing the synthesis of the coordinative capacity of a subject. Because in coordination, components are mostly of nervous nature (the ability to respond quickly to a stimulus, the ability to maintain balance, optical, acoustic capacity, and kinesthetic receptors), we have developed a sample type test made in 2 stages, presented in the research process section: sample and data.

The sample type test consisted of a task of identical psychomotor nature for all subjects and included sequential movements of the body segments that required a high degree of neuromuscular coordination and required the main coordinative capacities (reaction capacity, balance, and rhythm). The test consisted of an exercise made up in the form of a stimulus situation that involved a response of each subject. The response of each topic was compared to the responses of the other subjects of the group to which it belonged.

In this context, the sample test functioned as a measuring tool in which we noted the number of correct executions. To carry out the statistical analysis, we have quantified the successes and failures in figures.

We consider that the test is faithful because it could be applied identically to all subjects, and it can thus be applied identically at the beginning of the first year of study and in the middle of the third year.

Each test was attended by 3 evaluators who independently scored the results. The verification of the validity and fidelity of the test was conducted by comparing the 3 evaluations obtained for each test. The degree of agreement between the assessors had a Pearson correlation coefficient with a value that indicates an excellent correlation for the field of motor tests [58].

This coordination test was performed in two stages:

1. Presentation of the sample

The subjects were informed what this sample consists of, then they learned the movements that were to be part of the experiment and worked symmetrically with both arms until they could achieve the sequence of the 8 movements themselves. Initially, to easily learn coordination movements, the subjects of the study simultaneously executed the 8 movements of the upper limbs. The combination of movements was performed twice, with the subjects being guided by the assessor and working in the mirror with needles. The subjects performed the simultaneous sequence of movements, and the assessor followed them to ensure that the subjects retained what they had to do. Subsequently, the movements were turned into a coordination exercise.

2. Actual execution of the sample

The subjects performed the movements using a new coordination, namely the delayed execution of the movements. The simplest possible combination was used, namely the preferred arm started in advance with a movement towards the less-used arm. Thus, in the case of right-handed people, when the right arm executed the first movement, the left arm remained in the initial position; when the right arm executed the second movement, the left arm executed the first movement and so on until the exhaustion of the 8 movements. An important requirement for the students was that the movements of the two arms, even if in the actual execution of the test are different, must be performed simultaneously. This must be noted because there is a tendency to execute the movements in succession. Moreover, the coordination exercise was carried out twice together with the assessor who worked in front of them, in the mirror. After a one-minute break, the subjects were effectively tested and were asked to repeat the test sample 3 times, without making a break between repetitions.

In order to have an overview of the coordination of the performers, we measured anthropometric indices (height, weight, and body mass index) and evaluated the strength by determining of the maximum anaerobic alactacide power [59]. For this evaluation, we applied the Sargent jump test [60] on all 3 groups of tested subjects. The alactacid anaerobic effort is specific to activities that have a high energy flow and involves efforts of speed and strength and is found in sports games. We evaluated this type of effort because, at SMP, we have subjects who practice football, volleyball, handball, and basketball. Sports games involve many specific motor skills and are based on an acyclical effort, with a variable intensity, which stretches over a relatively long period of time. The alactacid anaerobic effort depends on the functional state of the organism, on the efficiency of the neuromuscular system, and on the efficiency of the central nervous system through which the rapid alternation of excitation and inhibition is achieved, respectively, of the contraction and relaxation, determining the motor quality of the movements [61].

3. Results

The data collected from the three groups of students can be seen in Table 1:

Table 1. Data collected from test students.

Study Program and Year	Total of Successful Tests	Successes 1 out of 3 Tests	Successes 2 out of 3 Tests	Successes 3 out of 3 Tests
SMP I	36	9	11	16
	60.00%	15.00%	18.33%	26.66%
SMP III	39	9	12	18
	65.00%	15.00%	20.00%	30.00%
Difference between year I and year III	5%	0%	1.67%	3.34%
PA I	33	9	10	14
	55.00%	15.00%	16.66%	23.33%
PA III	48	11	17	20
	80.00%	18.33%	28.33%	33.33%
Difference between year I and year III	25.00%	3.33%	11.67%	10.00%
KSM I	35	11	15	9
	58.33%	18.33%	25.00%	15.00%
KSM III	40	15	16	9
	66.66%	25.00%	26.66%	15.00%
Difference between year I and year III	8.33%	6.67%	1.66%	0%

Regarding the composition by sex of the groups of tested students, the number and percentages are found in Table 2.

Table 2. Data collected from the group of students on gender distribution.

Sports and Motor Performance—SMP				**Kinesiotherapy and Special Motricity—KSM**				**Performing Arts (Acting)—PA**			
First year of study		Third year of study		First year of study		Third year of study		First year of study		Third year of study	
180 students		128 students		180 students		153 students		98 students		60 students	
Girls 56	Boys 124	Girls 54	Boys 74	Girls 104	Boys 76	Girls 95	Boys 58	Girls 52	Boys 46	Girls 33	Boys 27
31.11%	68.88%	42.18%	57.81%	57.77%	42.22%	62.09%	37.90%	53.06%	46.93%	55.00%	45.00%
The percentages achieved on thethree groups tested											
Girls 35.71%		Boys 64.28%		Girls 59.75%		Boys 40.24%		Girls 53.79%		Boys 46.20%	
Percentages achieved on the entire test											
Girls 49.31%						Boys 50.68%					

The results of the coordination test, calculated as a percentage, are seen in Figure 1.

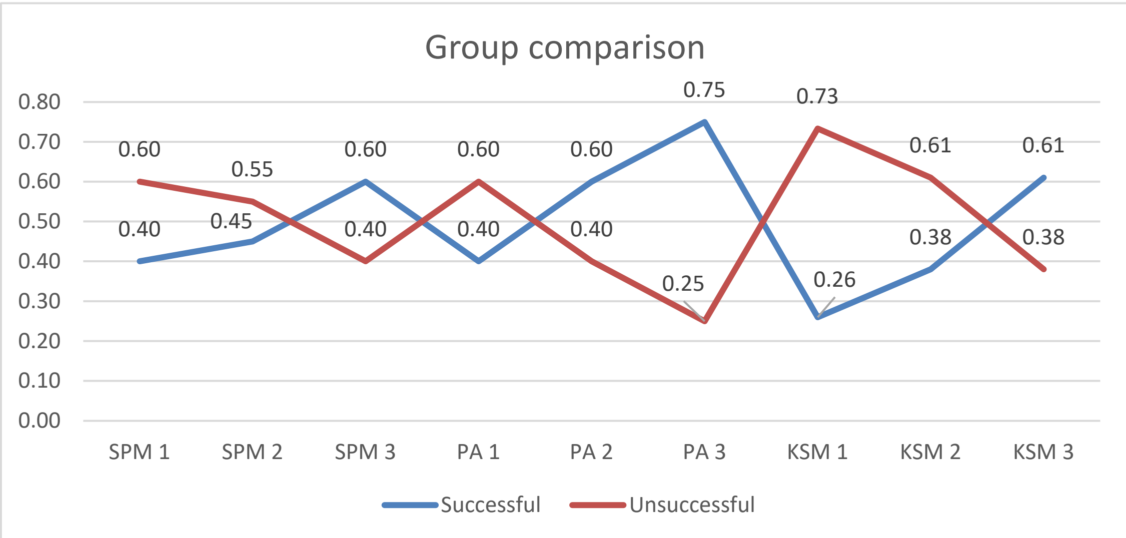

Figure 1. The results obtained by the students at the coordination test—group comparison.

The biggest difference between the successful and failed tests in the two tests, i.e., 50.00%, is observed in PA, meaning that the actors had a correct evolution from a methodological point of view as they were on the learning level. The success rate increased from group PA from 25% to 75%. Thus, we may affirm that H1 and H2 are confirmed.

The SMP athletes have a rich motor experience, and their evolution was not significative. One may observe that the difference between successful and unsuccessful tests was 20.00%. We observe a positive evolution in KSM (23%), but it was not impressive (Figure 1).

We can see that PA managed, through learning, to reach the highest level of coordination, namely 80.00% of the subjects were able to perform the test (Table 1).

The descriptive statistics show that the data in the sample are homogeneous because the standard deviation is at the average level. Kurtosis is less than three and skewness is less than eight [62], which means that our data source has a normal curve. Thus, we can apply additional statistics (Table 3).

Table 3. Descriptive statistics—three groups and three tests.

	SMP1	SMP2	SMP3	PA1	PA2	PA3	KSM1	KSM2	KSM3
Mean	0.40	0.45	0.60	0.40	0.60	0.75	0.27	0.38	0.62
Standard Error	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Standard Deviation	0.49	0.50	0.49	0.49	0.49	0.44	0.45	0.49	0.49
Sample Variance	0.24	0.25	0.24	0.24	0.24	0.19	0.20	0.24	0.24
Kurtosis	−1.89	−2.03	−1.89	−1.89	−1.89	−0.62	−0.86	−1.82	−1.82
Skewness	0.42	0.21	−0.42	0.42	−0.42	−1.18	1.08	0.49	−0.49
Count	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00
Confidence Level (95.0%)	0.13	0.13	0.13	0.13	0.13	0.11	0.12	0.13	0.13

In this regard, we decided to apply the *t*-test [63–66] to evaluate the statistical difference between groups. One may observe that there is a significative statistical difference between the average coordination of PA (mean = 0.58) and KSM (mean = 0.42). In this case, T stat (2.38) is greater than T critical (1.98), and the *p* value (0.01) is lower than the critical threshold, meaning that our hypothesis is accepted: the coordination for PA is better than the coordination form KSM (Table 4). The chosen subjects for PA are selected to have a higher motor-learning ability in comparison with KSM. In KSM, it is important to have a high overall coordination, but in PA, it is important to have a complex multisegmented coordination. Thus H2 (motor coordination can be driven/modified by motor learning actions) is confirmed.

Table 4. *t*-test: two-sample assuming equal variances PA-KSM.

	C_PA	C_KSM
Mean	0.583333	0.422222
Variance	0.137947	0.135091
Observations	60	60
Pooled Variance	0.136519	
Hypothesized Mean Difference	0	
Df	118	
t Stat	2.388303	
P(T $\leq$ t) one-tail	0.009256	
t Critical one-tail	1.65787	
P(T $\leq$ t) two-tail	0.018513	
t Critical two-tail	1.980272	

One may observe that there is no significative statistical difference between average coordination of SMP (mean = 0.48) and PA (mean = 0.58). In this case, T stat (−1.38) is lower than T critical (1.98), and the *p* value (0.16) is higher than the critical threshold, meaning that our hypothesis is accepted: the coordination for PA is better than the coordination form SMP, but it is not statistically significant (Table 5).

Table 5. *t*-test: two-sample assuming equal variances SMP-PA.

	C_SMP	C_PA
Mean	0.483333	0.583333
Variance	0.174859	0.137947
Observations	60	60
Pooled Variance	0.156403	
Hypothesized Mean Difference	0	
Df	118	

Table 5. *Cont.*

	C_SMP	C_PA
t Stat	−1.38496	
P(T≤ t) one-tail	0.084338	
t Critical one-tail	1.65787	
P(T≤ t) two-tail	0.168677	
t Critical two-tail	1.980272	

The analysis of anthropometric indices shows there is no standard model for the world of interpreters, preferring a typological diversity, but in the world of performance sports, a biological model is observed, revealed by studies of the field [67]. This biological model is established according to the sport practiced and gives the practitioners the possibility of obtaining a maximum motor efficiency in the activity carried out.

Furthermore, we designed a structured equation model (SEM) form with three variables: motor, bio, and performance. The motor variable is a formative one and is made of three tests of coordination and explosive force (Sargent test). Another formative variable is bio, which is formed of age and BMI (body mass index). We eliminated height and weight due to multicollinearity. The reflective variable indicates the performance of the athletes and represents the number of participations in national and international championships and the awards place (0 points—greater than 4, 1 point—place 3, 2 points—place 2, 3 points—place 1). We tested if the athletes' motric and the biological traits influence their performance in competitions (participation in international competitions and the place obtained).

The most important motric variables are explosive force with very high loading factor (Sargent—LF = 0.779), a coordination 3 (Coord3—LF = 0.708), followed by coordination 2 (Coord2—LF = 0.467), and coordination 1 (Coord1—LF = 0.193). The most important bio variables are age (LF = 0.933) and BMI (LF = 0.366). Regarding performance, both variables have very high loading factors: awards (LF = 0.971) and championships (LF = 0.847).

The path coefficients show motric factors have a greater influence (0.426) over the performance then the bio traits (0.043) (Figure 2). In future research, we will include other principal factors that could influence performance in competitions. The performance in SMP is influenced by motor factors and not by biological athletes' traits. Due to the athlete's performance, selection considers first the somatotype of the individual that must be adapted to the practiced sport.

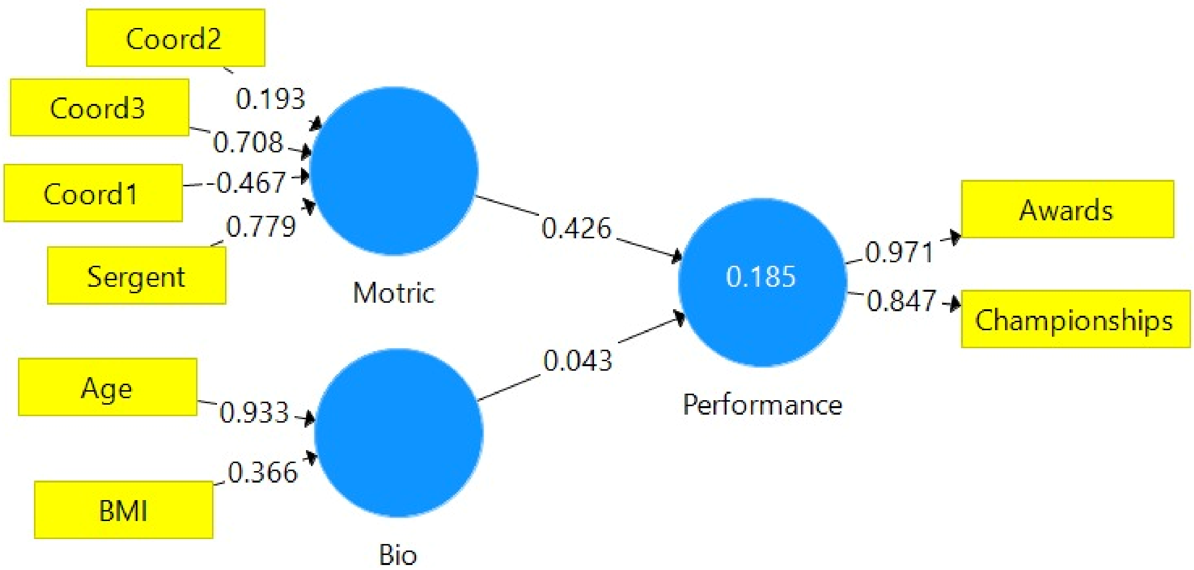

Figure 2. SEM-PLS factorial analysis for the SMP group.

Considering the research hypotheses, the research used SmartPls [53] to evaluate the consistency through composite reliability, as presented in Table 6. The minimum authorized values for a consistent model are as follows: composite reliability, >0.6; Cronbach's alpha and rho_A, >0.7—the authorized bottom value; square and AVE, >0.5. The Cronbach's alpha coefficients show that the variable of our model was appropriate for our analysis, meaning that subsystems that form the variables motor, bio, and performance are relevant for the model and have a positive and important influence. The mean extracted variance (AVE) of the performance variable is higher than the acceptable threshold of 0.5, so the convergent validity is confirmed (Table 6).

Table 6. Validation steps/tests.

Reflexive Construct	**Composite Reliability**	**Cronbach's Alpha**	**AVE**	**Rho_A**	**R Square**
	(>0.7)	**(>0.7)**	**(>0.5)**	**(>0.5)**	**(>0.5)**
Bio	-	-	-	1	
Motric	-	-	-	1	
Performance	0.907	0.902	0.830	0.915	0.185

To evaluate the significance of variables, the variance inflation factor (VIF) of each construct was performed with five thousand samples and a reliability of 95% through bootstrapping procedure with the help of SmartPLs software 3.0. The results are shown in Table 7. The two-tailed *t*-test in bootstrapping values is higher than 1.96. In other words, the values are higher at the critical level, which means they are significant [68]. *p* values are smaller than 0.01, meaning that our model is representative and validated. The path coefficients (0.426) have an excellent value (Table 8). All these criteria allow us to assess that our hypotheses are accepted. Thus, we may assume that for SMP, the motor factor is decisive in performance, in obtaining first places in champions, and is reflected in the number of participations in competitions. H2 and H4 are confirmed.

Table 7. Multicollinearity analysis.

VAR	**VIF**	**VAR**	**VIF**	**VAR**	**VIF**
Age	1	Coord1	1.591	Awards	3.084
BMI	1	Coord2	1.809		
ExForce	1.015	Coord3	1.732	Championship	3.084

Table 8. Bootstrapping significance.

	Mean	**St. dev.**	**T Stat**	***p* Values**	**Path Coefficient**
Motric → Performance	0.426	0.490	2.752	0.006	0.426

The variables motor, bio, and performance of SEM-PLS factorial analysis for PA and KSM groups indicate values that are not statistically significant.

Moreover, although KSM has the most spectacular evolution, the factorial analysis has no importance because students from the KSM profile usually do not participate in any international competitions or shows in festivals or competitions.

4. Discussions

H1 is confirmed. The technological methods used, having as a starting point the concrete and totally new situation that we faced during the COVID-19 pandemic, allowed the continuation of the educational process and improved coordination, a factor of sports and interpretive performance.

The restrictions imposed forced us to efficiently solve the learning methods, and it was found that the teaching, learning, and evaluation methods that take place online, in addition to the persuasion modalities, developed by the teacher to influence the students, require a level of interactivity that is manifested by the audio-visual stimulation through the use of digital multimedia programs, which together with the classical teaching methods have created a positive atmosphere for all participants. We can also observe this in a study that mentions that the introduction of technology into traditional physical education has a positive influence on the practice of physical education and sport [69], while another study shows the existence of significant differences in performance, in favor of those who have trained through technological methods, compared to those who have chosen to train through the traditional classical method of learning [70]. The literature indicates studies that have concluded that students' perceptions of technology-based pedagogy are not yet fully understood [71], and other studies mention the lack or insufficiency of knowledge about hardware and software or information technology (IT) [72], which requires the promotion of the compulsory acquisition of digital skills [73].

Following the recorded data, overall, we note that between the tests carried out in the first year and the third year of study, there are differences from 55% to 80% for the group from the Performing Arts (Acting) (PA) that has constantly and systematically worked the computer-assisted programs in the regime of four training sessions per week, which proves on the one hand the viability of the proposed learning programs and on the other hand the possibility of building programs that allow the evolution of students through computer-aided programs. The KSM values register difference from 58.33% to 66.66% in the first and third year of study, working in a regime of two specific workouts per week and then those from Sport and Motor Performance (SMP) have evolved from 60% successful tests in the first year to 65% in the final year, having only one coordination training per week, because the specific trainings of the sport they practice predominated. The programs allowed the recording of the individual execution, which could thus be analyzed in detail, allowing the execution with the necessary corrections much more precise, which diminished, through efficiency, the working time.

It is noted that at SMP, there is a higher number of boys, with 28.57% more, and at PA, the girls are more numerous, by a proportion of 7.59% (Table 2). Considering the composition of the two groups depending on the sex, the difference obtained in the coordination tests between the first and third year had a success rate of 25% at PA and 5% at SMP (Table 1), in the context in which PA and SMP are specialists in motion, so their work is well systematized and oriented towards obtaining the motor performance [74]. In this sense, we can mention that one of the reasons why these results were obtained is the better coordination in girls compared to boys indicated by studies in the field [37].

At KSM, there is a higher number of girls by 19.51%, and in this context, the success rate (the difference between tests) of 8.33% compared to the SMP group (with more boys and the success rate 5%) can lead us to the same conclusion: a better coordination capacity in the group with more girls.

However, gender differences in coordination can be influenced by a few factors, such as the level of physical condition and motor experience as well as individual factors. Therefore, it is important not to generalize or assume that one male or female person will be more coordinated than the other just because of their gender. In conclusion, the sex of the person may be one of these factors, but it is not the only one and should not be used as a main indicator of a person's ability to have good motor coordination.

H2 is valid: significant statistical difference between the average coordination of PA (average = 0.58) and KSM (average = 0.42)—values that can be seen in Table 4 but also the results of Table 5, and which indicates a better coordination at PA than at KSM in the conditions of online training—reflects the possibility of improving motor coordination through regular and repeated actions, even if they are young people between the ages of 20 and 25, young people in whom the biological potential is maintained at a plateau [75].

The results obtained with the coordination test (more successful tests at the final evaluation compared to the initial evaluation) reflect the fact that, regardless of the level of motor experience, the learning processes allow the motor nerve circuits to improve, and through regular practice, a new coordination exercise is learned, and the coordination skills in young adults are improved, given that the coordination components are carried out up to 20 years, with a high potential for development between 6 and 10 years, [76] when the plasticity of the nervous system is high compared to that of adults.

Moreover, motor coordination has seen increases in the conditions of online learning. Following the analysis of the motor behavior in the three groups of students, we note that in the development of motor coordination in addition to the natural evolution of childhood and adolescence, an advanced form of motor coordination also appears that is installed through the learning action, namely the formation of motor skills, which entitles us to say that the level of coordination can also be improved in this age group, based on motor schemes developed because of motor experiences, an aspect noted by other authors who mention the importance of their motor programs that can be retrieved from memory and adapted dependent to any given situation [28].

The statistical models obtained reflect the fact that for the athletes, the motor performance depends on the level of development of all the motor factors, even if one or the other prevails depending on the activity. Thus, it is obvious that to function as a unitary system, all these factors are needed to a greater or lesser extent.

In contrast, in the case of their actors, even if coordination is very important, their performance does not depend solely on it. They are also highly influenced by other factors such as expressiveness, motor creativity, reaction speed, and speed of adaptation to situations. Therefore, we can say that their aptitude structure is extremely complex.

In athletes who use cyclical movements (especially athletes who practice rowing), there is an apparent impossibility of learning new motor schemes, whereas in athletes who use motor diversity (dance, gymnastics, or fitness) or who practice sports games (which require quick adaptations to various situations determined by the player–team–opponent relationship), the speed of motor learning is very good. Moreover, in athletes, an increase in motor skills such as speed of action, reaction time, balance of muscle strength, skill, and coordination is noted [77].

The coordination of the upper limbs is one of the important functions of the motor system that requires a great effort of attention and control on the part of the brain, more so when a higher limb performs another movement, different and antagonistic from that of the opposing upper limb [78]. The repetition of bimanual coordination movements until they are memorized indicates the importance of visual, vestibular, and kinesthetic analyzers in the realization and, at the same time, the maintenance of those coordination models [79].

Given the involvement of the analyzers in the realization of the movement, we can argue that the repetition of movements in front of the mirror and subsequently in front of the computer with the help of the teacher's indications contributed to their better and faster motor learning. The contribution of sensory information to the learning of movements is a theme found in many studies; some argue that the absence of visual information increases the reaction time of both upper limbs [80], and the related sensory information can modulate the feedback between the limbs in such a way as to achieve reduced coordination [81], while others emphasize the major importance of the simultaneous action of the three visual, auditory, and kinesthetic analyzers in learning the coordination of the upper limbs. Direct observation of a movement (visual recording) performed correctly streamlines the training of coordination of the upper limbs [82].

In very young adults between the ages of 20 and 25 years, the development of the preferred upper limb is observed, under the influence of a sudden reduction in concrete actions and in relation to all the movements performed (for right-handed adults, most of the movements are performed with the right hand; for left-handers, with the left hand). Thus, we notice on the preferred side a greater motor finesse, greater skill, and the favorite limb that is more used can execute more complex movements.

The behavior of manual laterality appears as a testimony to cerebral laterality, given that there is a correlation with a hemispherical functional specialization for language [83]. Studies that analyze the behavior of manual laterality show us that between right-handed and left-handed people, there are many whose laterality is variable depending on the activity they perform and the circumstances [84].

In this context, the subjects had the freedom to decide for themselves which is the preferred upper limb. Our study indicates a much better execution of the coordination test on the preferred (dominant) upper limb, hence the possibility of its involvement in more complex movements, a finding also noted in other studies that mention the much better ability of the subjects to learn and adapt the movement much faster to new information when the execution is performed with the preferred upper limb [85].

Characteristics of the practiced sport influence the way in which the subjects, performance athletes, responded to the tests. In terms of coordination, athletes and swimmers who use cyclical movements, which are specialized until their transformation into automatism, show an inadequacy to the requirements of the test. In the practitioners of martial arts and sports games, expression sports that use acyclic movements, we notice a higher speed of learning of new types of coordination. The speed of learning increases in direct proportion to the diversity of the motor baggage they use. In terms of explosive force, the highest values were recorded in athletes and basketball players, followed by gymnasts and martial arts practitioners.

According to the obtained results, coordination depends on the level of strength development; studies also indicate other variables that can influence coordination such as motor qualities, resistance and speed, motivation, physical and mental health, the emotional component, the environment, and, finally, motor intelligence that helps the individual to structure information and easily achieve the scheme based on which he will achieve coordination of movements [52].

H3 is validated. A rich motor baggage refers to the experience and motor skills accumulated by a person through sports, games, dance, or other physical activities.

This rich motor baggage emerges from the following:

- All subjects of the three groups have developed basic motor skills. Moreover, the training program includes them, and these are essential for motor coordination and control of the body.
- All the subjects from PA practice dance, and of those from SMP, there are 14 subjects who practice martial arts, 9 subjects who practice expressive sports of dance and gymnastics, and another 27 who practice ball sports games; practicing these activities involves complex and detailed movements that require precision and fine control and lead to improved fine motor control.
- All the sports activities practiced by the subjects from SMP, but also the activities specific to the interpretive art practiced by the subjects from PA, increase the cognitive capacity, including attention, concentration, and working memory, which can improve the ability to coordinate movements.
- Physical and sports activities (for example, gymnastics) practiced by the subjects of the three groups require a good balance and correct positioning, and these improve the ability to coordinate movements.

To these are added to the final evaluation, the results of the successful coordination tests, according to Figure 1, but also the results obtained from the statistical analysis (the p value of 0.01 lower than the critical threshold indicates the significant statistical difference between the average coordination of the PA and the KSM, and the value p 0.16 is higher than the critical threshold, indicating a better coordination for the PA than for those from the SMP, but it is not statistically significant).

These results allow us to state that a rich motor baggage can help maintain good motor coordination by developing basic motor skills, improving fine motor control, increasing cognitive capacity, and developing the right balance and posture.

The young age of the study participants, namely 20–25 years, may be another factor that influenced the improvement of the motor coordination, being known that the aging process brings significant changes in the processing of visual information and in motor control [86], and coordination of the upper limbs may depend on the dominant hand, the degree of fatigue of the individual, the presence of any pathology, including vision problems, the presence of physical exercise in everyday life, stress, sleep deprivation, and mood swings [87].

Given that the literature draws an alarm signal on the lack of physical activity, something that we identify more and more often in the daily life of all age categories and which leads to a series of changes in the state of health, among which is the impairment of the motor coordination of the limbs [88], specific training to achieve motor coordination in the limbs contributes to the improvement of cognitive activity [89], such as attention and concentration, but this is only true for people who are developed psycho-physically normally [90] and contributes to increased performance motors [91]. Cognitive development is associated with the maturation of the structures of the central nervous system and defines executive functions, such as the creation and programming of movement, but also the resolution of possible incidents and accidents [92], and research prior to this study mentions the optimization of the relationship between the performance of coordination and the processes of superior nervous activity [93,94] and stresses the absence of fine motor coordination skills, such as upper limb coordination, i.e., hand–eye coordination in people with intellectual deficits of varying degrees [95].

H4 reflects the importance of optimizing motor skills in the automation stage, maintaining good coordination, influencing the optimization and/or retention of the level of sports motor performance.

The final evaluation highlights the improvement of coordination in the subjects of the three groups of the study. If in the group of those from KSM, there is a success rate (the difference between the successful tests) of 8.33%, compared to the success rate of 25% at PA and 5% at SMP, and the path coefficients show that the motor factor has a greater influence (0.426) on performance, we can say that motor skills in the most advanced phase of motor learning, namely that of automatism, positively influence motor performance. The mean extracted variance (AVE) of the performance variable is higher than the acceptable threshold of 0.5, which shows us that the improvement of motor skills leads to increased sporting and interpretive performance.

From the point of view of sports and competition activity, out of the 60 subjects from SMP, 4 presented a regress, 14 stagnated as evolution, and 32 recorded a progress between their performance activity, noted by us at the first test and their activity recorded after 3 years of work (reaching 45% of athletes with notable results). We mention that in the third year of study, the final evaluation was associated with the results obtained by the athletes at competitions: a performance athlete world champion in judo, another world vice-champion in kickboxing, a European champion (karate), and four European vice-champions (one in kickboxing, two in aerobic gymnastics—the duo race—and one in street dance), which allows us to conclude that there is a direct relationship between the level of coordination, automatisms, and performance in sports activity.

The progress in the tests carried out was like the progress made in the sports practiced, since we see that the best results were recorded in athletes whose activity is based on cyclical and complex movements in terms of coordination. For the group from PA, regarding the participation in national and international competitions in the field, we mentioned that although 53 students attended the preselection, so in a proportion of 88.33%, the number of those who won prizes was only 13 nationally and 6 internationally, yielding 21.66%. This clearly shows that for artists, an aptitude complex is necessary to obtain artistic performance, coordination being only one of them.

People who have practiced a certain sport regularly and continuously for many years may have stronger automatisms and be able to execute movements specific to their sport more easily, more precisely, without needing too much concentration and without requiring a prior analysis of the action itself.

At the same time, the lack of significant statistical difference between the average coordination of SMP (average = 0.48) and PA (average = 0.58) and the value of 65% at SMP compared to that of 80% at PA, values of the success rate of tests, leads us to state that athletes who have automatisms related to a particular sport may have more difficulty learning those coordination exercises different from the movements specific to their sport.

We mention some examples: The athlete from KSM who practices athletics and who presents automatism on the run, such a deep automatism that he failed to pass the coordination tests; however, in year III of study, he is the university runner-up in the 1500 m endurance test. The volleyball sportive from KSM who shows stereotypical movement on serving the ball, also a deep automatism, has only partially carried out the coordination tests; he was selected, at the beginning of this year, in the National Volleyball Team of Romania and obtained first place at the National Championship. The KSM sportsman who practices street dance has extremely varied movements, presents specific dance automatisms, pirouettes, jumping, and acrobatics and thus does not fix the automatisms, and the test coordination was carried out in full at all samples in both tests; he managed the performance of being the European runner-up during his third year as a student.

The results obtained suggest that when we operate with specific, complex automatisms, but also when we operate with deep automatisms, regardless of the result of the coordination test, we improve the sports performance. These results are obtained because of the difference that exists in the structuring of the motor response: the automatism obtained from cyclical sports involves the movement phase and a phase intermediate in which small corrections are made and is a high automatism based on movements executed without the intervention of the cerebral crust and under the control of lower hierarchical structures. When sports involving movements with diverse structure, acyclic movements generate a low automatism that is achieved in three phases: a preparatory phase, a phase of movement, and a phase of final re-evaluation, cyclical sports requiring the conscious intervention of willpower, attention, and concentration [96].

Thus, athletes may be less flexible in terms of coordination in a different context than their sport. However, that does not mean they cannot learn new or different coordination exercises. In fact, through regular practice and attention to technique, athletes can improve their coordination skills and learn to execute movements different from those in their main sport. However, it may require more concentration and effort for athletes to learn new and different coordination movements compared to those who do not have sports-specific automatisms.

In conclusion, in sports, motor skills in the automatism phase are essential to improve sports performance and achieve high levels of performance.

Although the sports students who perform in the field manifest automatisms regarding the sports activity practiced and acquire more difficult or easier other coordination of their non-specific movements, being influenced by the practiced sport, they, once again with the formation of motor automatisms, also improve their reflexes of self-insurance, prevention of incidents and accidents inherent in any sports branch.

Motor changes depend on the state of health of all systems and apparatuses of the human body. Coordination oscillations throughout an individual's life are not only organic, substrate disorders but also a result of the deletion of acquired habits and automatisms, which are part of the functional changes in the proportions and correlations achieved between the coordination levels. Deviations occur because of individual differences but at the same time are determined in which constitutional proportions between levels of coordination were formed [97]. The change in proportions is a primordial problem that is also defined as the individual motric profile and the correlations between the degree of development and the improvement of certain levels of structures of movements. Here we can also talk about the motor talent that is complex and that is why it is difficult to anticipate and solve from a methodological point of view. The motor profiles allow us to appreciate the quality of the correct execution of the movements, which gives them a great significance from the point of view of putting into practice the elaborated movement schemes. This leads us to the need to develop an observation system by which we can objectively determine both the motor profile of a student and the proportions in which a movement is technically performed, and this observation system can be operable (in the sense of effective application in the movement with a high degree of coordination).

The descriptive statistics show that the data in the sample are homogeneous because the standard deviation is at the average level, with values between 0.44 and 0.49 (Table 3). Thus, in the first year of the studio, all subjects were at the same level in terms of coordination.

At the final evaluation, there were recorded increases in the success rate at the coordination test and the following was found:

- Athletes who do not have strong automatisms because of the practiced sport can be more open to the development of new coordination skills, without interfering with the previous patterns created on account of the sports activity practiced. They are not based on previous motor experiences, and the most conclusive example we find is when testing footballers, where the cordoning test is successful, as athletes do not use their hands constantly in the game of football, the movement predominantly used being that of the foot.
- Athletes with strong automatisms have difficulty learning and performing the new skills they are trying to develop. Because of the high-level automatism, the athlete's brain can perform the same movements for coordination exercises, which will lead to errors and difficulties in learning new skills.

A motor ball in the phase of automatism improves movement, accuracy, constancy, and reaction speed and reduces mental effort. Through the constant and repeated practice of movements, athletes/performers acquire automatic motor skills, with positive effects on sports and interpretive performance.

However, our conclusions do not mean that learning coordination skills is exclusive to athletes who do not have strong automatisms.

We believe that any athlete can develop new coordination skills through training and practice, regardless of their current level of automatism, with the mention that athletes with strong automatisms may need more time, more concentration, attention, and effort to learn new coordination exercises.

The formation of motor skills and their automatisms to the adult depends on the level of individual experience and the specific trainings of the performance sport practiced.

In the group of sports students, we notice differences that appear and manifest themselves depending on the sport practiced. Thus, in sports that rely on a rich motor baggage (e.g., dance, gymnastics, and sports games), coordination is superior to sports that use cyclical movements (e.g., athletics and canoeing).

Just as the motor coordination is influenced by the practiced sport, the actors' training determines the development of a maximum potential on all levels, including at the motor level, the actors being a category of extremely receptive people who work for the development of the motor qualities, emphasizing the ability to generate the capacity of the coordination. Vsevolod Meyerhold said *The movement becomes the most powerful means of expression. The role of the stage movement is much more important than that of other theatrical elements*... [98].

5. Conclusions

The integration of educational programs in the online system by means of methods based on video analysis of movements contributes to the improvement of motor coordination and other parameters specific to the motor activity of deployment and implicitly to the optimization of sports and interpretive performance.

The motor coordination of young adults who practiced sports in school but were not athletes is at the level of those who have acquired automatisms after practicing performance sports, which means that they can more easily learn the activities of motor coordination.

Motor coordination can also be improved after the end of the period of growth and physical development of the organism (0–22 years), under the conditions of practicing sports activities up to that age.

The richness of the motor baggage contributes both to the maintenance and to the improvement of the motor coordination with positive influences on the sports and interpretative performance.

6. Strengths and Limitations

We consider that the strong point of this study is represented by the comparison between the three groups of students, very different in terms of coordination: a group of students who engage in movement at a high-performing level (students from SMP), a group that learns movement through what they do and tend to take it to the area of motor performance (students from PA), and a group of students who use movement constantly in the activity, like a hobby. This is a comparative study the likes of which we did not find to already exist in the literature specific to the field. The study highlights differences between the three groups in terms of coordination and emphasizes the role coordination in achieving motor performance.

In addition, this study reflects the possibility of improving coordination through training assisted by computer programs and in the online system.

In choosing the sample of subjects for this research, we started from the limited number of places existing in the artistic-vocational education system, which is small compared to the other specializations. However, the sample was also limited by the small number of athletes who engage in performance sports. Although there are many sports branches, performance is difficult to achieve, and that is why it is conducted by a relatively small number of people.

In the context of these two problems that we have faced, we consider that the sample of subjects in this study is a small one. It can be considered representative only for the promotion of 2022, without being able to generalize.

At the same time, we remind that in this research, we are only talking about the students existing at the time of the study conducted by us in the educational institutions in question. Therefore, we consider that we have conducted a case study for the class of 2019–2022, a special promotion due to the conditions in which students were forced to carry out their activity. We mention that in Romania, the period of restrictions due to the COVID-19 pandemic was between February 2020 and April 2022, with a peak point of restrictions in September 2020. During this period, it a drastic limitation of human interactions and the closure of all educational institutions was imposed, transferring the educational process to the online environment [99].

Furthermore, even if the evaluation of the subjects of the present study through the tests performed is simple, and it ensures that all tested subjects give a minimal response to the test, the evaluation is strictly indicative; the evaluation indicates only what the subjects were able to offer when they received the information. Therefore, the diagnosis does not allow us to obtain absolute values. For further research, we will take into account the possibility of testing the coordination through special devices; we will seek to find out which are the existing devices and to what extent we can use them.

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