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Predictive Values of Motor Dimensions in Motor Space

By Miroslavdodig
University of Rijeka, Croatia

Summary- The research was carried out on a sample of 256 subjects, 15 year old males, obtained from high school student population; a battery of 35 motor tests was used. In the aim of determining the latent structure manifesting motor space the method of main components was applied and thus the factor scores were define Hotelling, H. (1933). For the purpose of determining the relations between the predictive (the motor dimension space) variables and the criteria-based variable (the entire motor space) the coefficient of regression in a latent space was calculated. Through inspection of the results of regressive coefficients it is concluded that the cohesion between systems of predictors and criteria is mainly heterogeneous. The best projections and thus predictive values include: the repetitive strength factor (RF), the velocity factor (VF), the static strength factor (SF), and the explosive strength factor (EF). It is evident that all these factors belong to reactions that are mostly dependent on the process of regulating excitations that represent the existence of the first factor, that is, the general factor of excitation control. Poorer predictive abilities in terms of motor space have the preciseness factor (PF), the flexibility factor (FF), and the coordination (CF), while the balance factor (BaF) is attributed to the weakest predictive ability. Considering the obtained results, a necessity for applying contemporary methods of research within the scope of motor space is displayed. This requires a new, more contemporary way of researching motor space.

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Strictly as per the compliance and regulations of :

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Summary- The research was carried out on a sample of 256 subjects, 15 year old males, obtained from high school student population; a battery of 35 motor tests was used. In the aim of determining the latent structure manifesting motor space the method of main components was applied and thus the factor scores were define Hotelling, H. (1933). For the purpose of determining the relations between the predictive (the motor dimension space) variables and the criteria-based variable (the entire motor space) the coefficient of regression in a latent space was calculated. Through inspection of the results of regressive coefficients it is concluded that the cohesion between systems of predictors and criteria is mainly heterogeneous. The best projections and thus predictive values include: the repetitive strength factor (RF), the velocity factor (VF), the static strength factor (SF), and the explosive strength factor (EF). It is evident that all these factors belong to reactions that are mostly dependent on the process of regulating excitations that represent the existence of the first factor, that is, the general factor of excitation control. Poorer predictive abilities in terms of motor space have the preciseness factor (PF), the flexibility factor (FF), and the coordination (CF), while the balance factor (BaF) is attributed to the weakest predictive ability. Considering the obtained results, a necessity for applying contemporary methods of research within the scope of motor space is displayed. This requires a new, more contemporary way of researching motor space.

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I. Problem

Significant theoretical and practical breakthroughs have been made in structural differentiation and system dispersion in kinesiology in recent years which have influenced its development. The progress of kinesiology depends considerably on the development of new methodological approaches yielding important information. Its purpose is to ensure the transition from single empirically chosen systematically unorganized indicators to systematic model of application. Also, it needs to be said that there are laws of kinesiology that are still to be discovered and stated in an objective qualitative and quantitative form. In spite of numerous scientific attempts made to classify motor space and determine motor space structure, the generalization of date, much has been done in terms of reliable motor measuring instruments construction and systematic have been conducted with respect to factors, and an effort to create a structure model of motor space has been made. This has been made possible due to the contributions made by many researches and scientists: Anohin, K. K. (1970), Bernstein, N. A. (1947), Curetona (1947), Hempel and Fleishmane (1955),Fleishmane (1954), Gredelj, M., Metikoš, D., Hošek, K. &Momirović, K. (1975), Kurelić, N., Momirovič,K, Stojanović, M., Šturm, J., Radojević, Đ. &Viskić-Štalec, N. (1971, 1975), Metikoš, D. & Hošek, K. (1972), Pistotnik, B., Milić, R. (1996), Pišot, R. (1999), Šturm, J., Strel, J. &Ambrožič, F. (1990). Dodig, M. (1979, 2008, 2010), Starosta, W.(2003); and many others. In recent times, a trend of using composite tests which are somewhat more reliable has emerged; however it is still insufficient to encompass a practically limitless variability of motor expression Pišot, R. (1998)., Šturm, J., Strel, J. & Ambrožič, F. (1990). At younger ages. Zhu, W., Cole, L. E.(1996). Magill, R.A. (1997), Bala, G., Popović, B., Stupar, D. (2002). Momirović, K., Wolf, B., Popović, D. (1999). Based on the available research so far, it is extremely difficult to define factor structure and to generalize motor dimensions that exist in motor space in the field of motor science, due to high variability. Despite high variability of motor dimensions structure, motor space has been achieved, but from the structure standpoint it still remains underexplored as well as the factors that determine it. Based on the available analyses, discussions and researches; explosive strength factor, repetitive strength factor, static strength factor as well as velocity, preciseness, flexibility, balance, and coordination factors have been defined. However, regardless of the numerous scientific researches aimed at classifying motor abilities and determining motor dimensions that would define motor space, generalization of results and findings remains impossible. Lack of information is felt in terms of hierarchical structure of motor dimensions and their predictive value with respect to motor space existence. Therefore, the main aim and task of this research is an attempt to explore relations of isolated motor dimensions subsystems and their predictive value in motor system.

II. Methods

a) Sample of Subjects

The sample of subjects was obtained from high school student population, 15 year old males. The sample of subjects consisted of a group of 256 subjects.

Author: Independent Researcher University of Rijeka, Croatia.
e-mail: dodig@pfri.hr

b) Sample of variables

As per research purpose, 35 manifesting kinesiological reactions that have already been information carriers in many previous kinesiological researches have been analyzed on this occasion. Therefore, it was logical to assume that valid predictors of functional structures presented in previous cases would be found in this sample as well.

1. Set of factors of explosive strength (EF) has been estimated with the help of four measuring instruments: 1. MDM – standing long jump, 2. MBMP – medicine ball chest throw, 3. MBML – medicine ball throw laying down, 4. MTRS – standing triple jump.
2. Set of factors of repetitive strength (RF) has been estimated with the help of five measuring instruments: 1. MSK – push-ups, 2. MDTK – lifting up torso from the Swedish bench exercise, 3. MNK – jumps onto the Swedish bench with 1/3 weight, 4. MIST – torso straightening up exercise, 5. MMZ – mixed pull-ups.
3. Set of factors of static strength (SF) has been estimated with the help of five measuring instruments: 1. MIZG – pull-up endurance, 2. MIZ – turn endurance, 3. MIPR – push endurance, 4. MIZP - half-squat with ½ body weight endurance, 5. MIZS – parallel bars endurance.
4. Set of factors of preciseness (PF) has been estimated with the help of four measuring instruments: 1. MPIK – darts, 2. MGAN – hitting a target by foot using a tennis ball, 3. MGAR – hitting a horizontal target by hand, 4. MSTIL – stile.
5. Set of factors of flexibility (FF) has been estimated with the help of four measuring instruments: 1. MISP – a side-turn with a bat, 2. MPS – stretching forward while sitting exercise, 3. MSPA - a split, 4. MPZD – stretch forward – side-turn – touch.
6. Set of factors of velocity (VF) has been estimated with the help of five measuring instruments: tampping by hand, 2. MT4X5 – running 4x5 meters, 3. MTAN – tampping foot against a wall, 4. MD30 – lifting up torso in 30 seconds, 5. MUCL – pressing down while squatting – pressing down while laying.
7. Score of coordination factors (CF) has been estimated with the help of four measuring instruments: 1. MKKII - KKII, 2.MS3M – slalom with three medicine balls, 3. MOZ – agility in the air, 4. M20P – 20 steps forward with a bat.
8. Score of balance factors (BaF) has been estimated with the help of four measuring instruments: 1. MRAV – standing on one leg with eyes closed, 2.MPSG – standing diagonally on a low beam 3. MSOK – standing on an upside-down balance bench, 4. MSUK – standing horizontally on one leg on a balance bench.

For hypothetically defining the entire motor abilities space, motor dimensions were considered, those which had been extracted during the preliminary research: (1) explosive strength factor (EF), (2) repetitive strength factor (RF), (3) static strength factor (SF), (4) preciseness factor (PF), (5) flexibility factor (FF), (6) velocity factor (VF), (7) coordination factor (CF), (8) balance factor (BaF).

c) Methods of data analysis

Methods of data transformation, condensation, and mathematical analysis have been chosen according to the data analysis demands. By using standard descriptive procedures, characteristics of the measuring instruments have been determined. Arithmetic means (XA), variances (SIG2), standard deviations and half-range in which there is a 95% fluctuation in the real value of arithmetic mean (DX). Minimum (MIN) and maximum (MAX) result values have also been determined, and all results have been categorized in corresponding classes. Normality of Distribution Hypothesis has been tested using the Kolmogorov-Smirnov test, which allows for the rejection of a hypothesis if a maximum difference allowed (MAXD) between obtained relative cumulative frequencies (FCR) and expected relative frequencies (FCT) is bigger than, or equal to, the value given under the TEST mark. The coefficients of correlation (R) of all manifesting variables as a product of set vectors of standardized results have been calculated. Seeing as a preset value for zero-hypothesis rejection is an error set at 0, 05 all coefficients bigger than .12 can be considered statistically significant. Specific variances of manifesting variables from inverted correlation matrix have been calculated (specific variance contains error variances and specific variables variance).Partial correlations (RP) of manifesting variables have also been calculated, i.e. coefficients of interconnectedness of manifesting variables pairs (the mentioned data has not been presented due to its extensive volume).

Furthermore, factor analysis of motor space with manifesting variables has been made relative to motor dimensions scores. With the aim of determining latent structure of manifesting variables of motor subspaces, the inter correlation matrix has been factorized using Hoteling's Principal Components Method and in this way factor scores have been defined, Hotelling, H. (1933). Based on the obtained factor scores, partial correlations (RP) within factor scores have been calculated, i.e. the coefficients of interconnectedness of factor scores pairs. Characteristic inter correlations matrix square roots have been marked with LAMBDA. A criterion according to which first principal component whose characteristic first and largest square root is always bigger than 1.0, is considered significant; has also been determined. Both the characteristic square root and the relative cumulative contribution that explains the overall variables variance have been calculated. The value of relative cumulative contribution of the largest square root multiplied by 100 gives the explained variance percentage for the entire system of manifesting variables. The main components of the inter correlations matrix are shown under (H). Furthermore, communalities (h2) of the predictive variables have also been calculated. It is a part of variance of every predictive variable that can be explained in terms of an isolated latent dimension system. With the aim of determining relations between predictive (motor dimensions subspace) variables and criterion variable (the entire motor space) the coefficient of regression (B) in latent space has been calculated.

III. Results

As per research purpose, 35 manifesting kinesiological reactions that have already been information carriers in many previous kinesiological researches, as well as a number of new or modified measuring instruments, have been analyzed on this occasion. Therefore, it was logical to assume that valid predictors of functional structures presented in previous cases would be found in this sample as well.

According to the obtained results, it can be concluded that the parameters and distribution of subspace scores of motor variables are normal based on the test criteria proposed by Smirnov and Kolmogorosov. Based on the data obtained, inter correlations, partial correlations and specific score variances of all subspaces of motor space have been calculated. By inspecting inter correlation scores matrix of all subspaces (Table 1 above the large diagonal) applied for determining the entire motor space, first and foremost, the information about the level of cohesion of motor space dimensions was obtained.

Table 1 : Intercorrelations (above the large diagonal). Partial c orrelations (below the large diagonal) and specific variances (in the large diagonal) of motor factors

	EF	RF	SF	PF	FF	VF	CF	BaF
EF	.68	.49	.28	.21	.29	.43	-.24	.13
RF	.32	.47	.60	.29	.20	.54	-.28	.25
SF	-.07	.45	.58	.38	.16	.44	-.18	.15
PF	.05	-.01	.26	.80	.08	.28	-.25	.08
FF	.16	-.07	.02	-.07	.80	.35	-.28	.17
VF	.17	.26	.14	.10	.24	.60	-.22	.20
CF	-.06	-.11	.03	-.18	-.20	.01	.18	-.24
BaF	-.04	.13	-.01	-.02	.07	.06	-.16	.89

Legend: (EF) Explosive strength factor,(RF) Repetitive strength factor, (SF) Static strength factor,(PF) Preciseness factor,(FF) Flexibility factor, (VF) Velocity factor, (CF) Coordination factor, (BaF) Balance factor.

Values of correlation coefficients between motor dimensions range from .08 to .60 meaning there is a wide range of cohesion within the entire motor system, which consequently results in instability within certain dimensions of the system. Explosive strength factor (EF) has the strongest correlation coefficient with the repetitive strength factor (RF) .49, and with the velocity factor (VF) .42. Relatively strong factor correlations between the explosive strength factor and these two factors were to be expected due to the mechanism on which the factor in question is based, which is the regulation of excitation intensity.

Repetitive strength factor (RF) and velocity factor (VF) in their respective structures contain activation of a large number of motor units in order to develop force, which is needed as the starting impulse to perform movement. Explosive strength factor is dependent on a basic structure, basic mechanism; i.e. that factor is primarily dependent on one regulative mechanism whose task is to decode excitation intensity in primary centers and in factors. Explosive strength factor has weak but significant correlations with other factor which was to be expected considering the regulation of movement mechanism. Its weakest correlation is with the balance factor which is understandable.

Repetitive strength factor (RF) which is characterized by intensity regulation and duration mechanism. Logically, it has the strongest coefficients of correlation with those factors that have similar mechanism structure. It shares its strongest correlations within the motor system with the static strength factor (SF) .60 which also represents the strongest correlation in the entire system. It also has good correlations with the velocity factor (VF) .54 and the explosive strength factor (EF) .49. It is clear that mechanisms for intensity regulation and duration are responsible for such coefficients of correlation. Repetitive strength factor has significant coefficients of correlation with all other factors, the weakest of which is with the flexibility factor (FF) .20. It should be pointed out that the repetitive strength factor has the strongest correlation in the entire space with respect to other factors.

Static strength factor (SF), whose variability and covariability are dependent on the intensity regulation and duration mechanism; has the strongest coefficient of correlation with the repetitive strength factor (RF) .60, which was to be expected. Also it has a relatively good correlation with the velocity factor (VF) .44 and the preciseness factor (PF) .39. With other factors it has weaker coefficients of correlation; however, all are significant; it has the weakest correlation with the balance factor (BaF) .15. The interconnection of static strength factor (SF) and the repetitive strength factor (RF) is logical seeing as it includes a transfer of regulation mechanism for the said structures. Based on the obtained correlations between the static strength factor and factors of velocity (VF) and preciseness (PF), here can be assumed the existence of relation between the process of excitation intensity and duration and the process of referentation control contained in the latent structure of velocity and preciseness factors. Such assumption confirms the fact that it is a process of primary referentation which is the characteristic of balance factor (BaF) where the correlation is weak, but that it is a secondary referentation.

Preciseness factor (PF) whose variability and covariability are dependent on the mechanism for bilateral integration of movement, formation of ideomotor structures and control of referentation process. The preciseness factor has the strongest interconnection with the static strength factor (SF) .38, repetitive strength factor (RF) .29 and the velocity factor (VF) .28. It has somewhat weaker, but still significant correlations with the explosive strength factor (EF) and coordination factor (CF), while it has very weak and insignificant correlations with the flexibility factor (FF) and the balance factor (BaF), which are also the only insignificant coefficients of correlation in the entire system of motor factors.

Flexibility factor (FF) whose variability and covariability are dependent on the mechanism for regulation of synergic processes, referentation process, regulation of tonus of muscle groups and relaxation of antagonists. The flexibility factor has the strongest correlations with the velocity factor (VF) .35, explosive strength factor (EF) .29 and coordination factor (CF) .28. It has slightly weaker but significant correlations with the repetitive strength factor, coordination factor and static strength factor; while it has insignificant correlation with the preciseness factor.

Velocity factor (VF) whose variability and covariability are dependent on the mechanism for bilateral integration of movement, formation of ideomotor structures and control of referentation process, and alternative innervation of muscles. It has the strongest correlations with the repetitive strength factor (RF) which is logical because repetitive strength factor contains a fair amount of alternative innervation of muscles, and that particular mechanism is one of the principal regulators in the velocity factor system. Furthermore, this factor also has relatively good correlations with the static strength factor (SF) .44 and the explosive strength factor (EF); it is probably the case of same transfer relations from the same mechanism. Also, it has relatively good correlation with the flexibility factor (FF), which is probably the result of the influence of the process of tonus regulation and muscle relaxation of agonists and antagonists, which is a part the mechanism structure for regulation of flexibility. As far as other factors are concerned, the velocity factor has slightly weaker but nevertheless significant correlations. He is factor that has second strongest correlations overall, as far as the entire space of motor factor is concerned.

Coordination factor (CF) whose variability and covariability are dependent on the mechanism for bilateral integration of movement, formation of ideomotor structures and referentation control. The coordination factor has all significant coefficients of correlation (the negation in front is the consequence of measuring instruments structure that attribute stronger value to weaker result thus changing it), and it has the strongest correlation with the repetitive strength factor (RF) . 28, the flexibility factor (FF) .28, and a slightly weaker with the explosive strength factor, the preciseness factor and the balance factor. It has the weakest correlation with the static strength factor .18.

Balance factor (BaF) whose variability and covariability are dependent on the mechanism for bilateral integration of movement, formation of ideomotor structures and control of referentation process. The balance factor is the factor with the weakest coefficients of correlation with other factors in this entire space, which was expected due to the structure of measuring instruments and their projections for the joint measuring object. It shares the most significant correlations with the repetitive strength factor .25 and the coordination factor .24, while other correlations are weaker but significant, except for the preciseness factor which is insignificant.

Partial correlations (Table 1 below the large diagonal) show cohesion between factors with the remaining system of factors orthogonalized, making it a constant unable to influence the cohesion between factors. Partial correlations in the entire motor space are different from the original in that they are weaker, and some also have negative partial connection, which is not true for the correlation factor whose negativity stems from the structure of measuring instruments. When the influence of other factors is isolated then the repetitive strength factor (RF) and the static strength factor (SF) have the strongest particle correlations in the entire space. The repetitive strength factor and the preciseness factor have the weakest partial correlation that is also negative. The balance factor has negative partial correlations with the explosive strength factor, the

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preciseness factor, the coordination factor, and the static strength factor. It is clear that the balance factor does not have a lot of points in common in this space. Specific variances of factors in the entire motor space (Table 1, in the large diagonal) are indicative of the highest possible percentage of variance error contained by a specific factor in its measuring structure. Those values are proportionally high particularly in those latent dimensions that have the mechanism of regulation responsible for the bilateral integration of movement, and especially for the formation of ideomotor structures and the control of referentation process. Those factors that have regulation mechanisms based on the simple structures of excitation intensity and duration have fairly solid specific variances. The coefficient of determination is fairly low which means that the lowest possible variance that is valid in the entire system is 29, 28%. The reason for high specific variances and low coefficient of determination lies primarily in inadequate measuring instruments used to deal with the motor dimensions of preciseness, coordination, balance and flexibility. By solving characteristic equations and calculating characteristic Lambda square roots in the entire motor dimensions space (Table 2) the main scores component of all motor space subspaces was obtained.

Table 2 : Significant characteristic matrix square roots of factor intercorrelations and cumulative proportion of the explained variance

	LAMBD	CUMULATIVE	
1.	3.04	.38	the last own value used
2.	1.10	.52	
3.	.72	.63	
4.	.85	.74	
5.	.68	.82	
6.	.60	.90	
7.	.49	.96	
8.	.32	1.00	

Legend LAMBDA – characteristic square roots of matrix intercorrelations, CUMULATIVE- relative cumulative square root contribution.

It is evident that the isolated main component of the set has accounted for 38% variance of the entire motor system, which also represents the main information carrier about this system. Hotelling factor matrix – (Table 3) shows orthogonal projection of the variables to the isolated main component. The results show that the strongest projections to the main component in the entire motor system belong to the repetitive strength factor (RF), the velocity factor (VF), the static strength factor (SF) and the explosive strength factor (EF). Weaker projections belong to the coordination factor and the preciseness factor, while the balance factor has the weakest projection.

Table 3 : Main component of the factorintercorrelations matrix (H), communalities (h2) and coefficients of regression (B)

	H	h2	B
EF	.66	.43	.22
RF	.80	.65	.26
SF	.70	.49	.23
PF	.52	.27	.17
FF	.48	.23	.16
VF	.75	.56	.25
CF	-.51	.26	-.17
BaF	.39	.15	.13

Legend (see Table 1)

H – Main components of intercorrelations matrix, h2 – communalities, B – coefficient of regression

Communalities (Table 3-h2) are relatively good for the repetitive strength factor (RF), the velocity factor (VF), the static strength factor (SF), and the explosive strength factor (EF); which leads to the conclusion that the said factors are responsible for the biggest contribution in terms of the isolation of the main component. Lower communalities, some of which are borderline acceptable, include the preciseness factor (PF), the coordination factor (CF), and to an extent, the flexibility factor (FF). The lowest and extremely weak communality has the balance factor (BaF).

Regression coefficients of the scores of all motor space subspaces (Table 3-B) show cohesion between motor dimensions and the entire motor space and are generated in the main component section. In this way, predictive values of specific dimensions in motor space are obtained. By inspecting results of the regression coefficients, it can be concluded that the cohesion between the system of predictors and the criteria is rather heterogeneous. Segments of factor projections to motor space range from .13 to .26. The best projections and thus also the best predictive values belong to: the repetitive strength factor (RF), the velocity factor (VF), the static strength factor (SF) and the explosive strength factor (EF). It is evident that all these factors belong to reactions that are mainly dependent on the process of excitation regulation which represents the existence of the first line factors, i.e. the general factor of excitation control. The preciseness factor (PF), the flexibility factor (FF), and the coordination factor (CF) have poorer predictive abilities in terms of motor space, whereas the balance factor (BaF) has the poorest predictive ability. All these factors belong to a group of reactions that is dependent on the process of regulation of integration, regulation and control in the second line space. Poor predictive value of factor that are regulated by the general factor of integration, regulation and control, is based in the inadequate structure of measuring instruments that have poor liability. Regardless of the numerous studies conducted about the latent motor space structure, the said space has yet to be determined. Based on the available analyses, discussions and researches motor space has been partially defined, however, it is still insufficient, seeing as the available results are neither cohesive nor conclusive enough. Considering the quantitative and qualitative versatility of movement in certain body segments, or in body as a whole; it is more or less possible to achieve large movement variability. Based on anatomic, functional, and biomechanical laws, which represent the source of a partial explanation for the body movement phenomenon; formation of a whole range of codependent movement factors is possible. In order to achieve movement, integration of a wide spectrum of factors must be achieved, with both bone and joint elements, and muscular and nerve structures having the primary role. There are no independent local processes; which means that every element has its own specific importance in the movement process. The main reason lies in the exclusive use of phenomenologically determined group of individual motor expression. Furthermore, the use of different methods, samples that are too small, inadequate data-checking; and above all, lack of adequate measuring instruments; contributes to such a situation. Due to all this, there is not enough information about correlations between motor dimensions within motor space; which consequently leads to the necessity of developing a different, more contemporary and more efficient research approach in kinesiology.

IV. Conclusion

The research was carried out on a sample of 256 subjects, 15 year old males, obtained from high school student population; a battery of 35 motor tests was used in the aim of analyzing motor space and conducting predictive value of factor scores on motor space. The main problem that needed to be solved was a problem of objective defining of latent motor dimensions, and the main task was determining the existence and nature of manifesting variables in latent space of motor dimensions and their predictive value in motor space. By performing standard descriptive procedures, the characteristics measuring instruments were determined. Furthermore, factor analysis of motor space relative to motor dimensions scores was conducted with the variables. In the aim of determining the latent structure of manifesting motor space variables the intercorrelation matrix has been factorized using Hoteling's Principal Components Method and in this way factor scores have been defined, Hotelling, H. (1933). For the purpose of determining the relations between the predictive variables and the criteria-based variable the coefficient of regression in a latent space was calculated.

The obtained predictive values of specific dimensions in motor space between the system of predictors and the criteria are rather heterogeneous. Segments of factor projections to the motor space range from .13 to .26. The best projections and thus also the best predictive values belong to: the repetitive strength factor (RF), the velocity factor (VF), the static strength factor (SF) and the explosive strength factor (EF). It is evident that all these factors belong to reactions that are mainly dependent on the process of excitation regulation which represents the existence of the first line factors, i.e. the general factor of excitation control. The preciseness factor (PF), the flexibility factor (FF), and the coordination factor (CF) have poorer predictive abilities in terms of motor space, whereas the balance factor (BaF) has the poorest predictive ability. All these factors belong to a group of reactions that is dependent on the process of regulation of integration, regulation and control in the second line space. It is known that motor abilities participate in performing motor tasks and represent manifesting motor space. Seeing as the number of expressing motor tasks is limitless, in analyses, Pzhenomenologically determined groups of individual motor expressions are exclusively used. This demonstrates there are numerous measures that define that space. Parameters that are used for measuring motor abilities of strength, velocity, coordination, flexibility, preciseness, and balance are based on the phenomenological characteristics of the said space. Phenomenological characteristics of motor space are determined by factors that gain their importance according to the abilities that share the biggest part of their variance with the factor. It is, therefore, the structural approach that enabled factor determination from explosive strength, repetitive strength, static strength and velocity segments; which was not the case with coordination, flexibility, preciseness and balance motor space. Poor predictive value of factors that are regulated by the general factor of integration, regulation, and control of movement processes; lies in the inadequate structure of measuring instruments with poor liability. Consequently, a necessity for applying more contemporary methods of research in order to discover the truth about motor space is displayed. This requires a new, more contemporary way of researching motor space.

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