Dr. Bor Sojar Voglar, univ. dipl. psih.
Alma Mater Europaea Dance Academy

Peter Majzelj, prof. šp. vzg.
Faculty of Sport, University of Ljubljana

Dr. Petra Zaletel, prof. šp. vzg.
Faculty of Sport, University of Ljubljana

STATISTIČNA ANALIZA OMEJITVENEGA PROGRAMA PLESA RUMBA V LATINSKO-AMERIŠKIH TEKMOVALNIH PLESIH
STATISTICAL ANALYSIS OF THE BASIC SYLLABUS FIGURES OF RUMBA IN LATIN-AMERICAN BALLROOM DANCING

ABSTRACT

The principle of gradually developing choreographies in ballroom dancing is essentially achieved by the separation into basic and open program dance figures. Basic figures are further divided into difficulty levels by different international dance organisations without considering objective criteria of difficulty, and that is one of the main reasons why the classifications differ. The goal of this research was to statistically analyse the basic syllabus figures of the Latin-American dance Rumba and to discover the potential of objectively determining the difficulty levels in ballroom dancing. We have analysed 34 dance figures from the basic rumba syllabus from two Latin-American technique books – the Imperial Society of Teachers of Dancing (ISTD) and the International Dance Teachers' Association (IDTA). Based on the literature we have determined the value of each figure based on seven variables: number of steps, amount of turns, number of actions, difficulty of actions, asymmetry, number of positions, and progression. We have analysed the data using hierarchical cluster analysis and have discovered that two main difficulty levels of dance figures are being clearly distinguished. There was a possibility for a third difficulty level, however the differences between the second and third level were small. 16 figures have been classified into the first group (less difficult) and 18 figures into the second group (more difficult). All seven variables were significantly important in determining the two groups. The results are comparable with the existing classifications – including the latest by the World DanceSport Federation (WDSF). The observed differences are supported by empirical evidence and represent the foundation for discussing the adequacy of the existing classifications. We recommend our statistical approach as a model for verification of all ballroom and Latin basic dance figures classifications. We hope that our method and classification can be used as a guide for choreographers and teachers of ballroom dancing.

Key words: Rumba basic syllabus figures, Latin-American ballroom dancing

INTRODUCTION

Brief History of Ballroom Technique

Competitive ballroom dancing or Dancesport got its recognition amongst other established dance forms in 1924 when a Ballroom branch was formed within the Imperial Society of Teachers of Dancing (ISTD) (Silvester, 1990; Howard, 2002). This event Victor Silvester, the first ballroom dancing World champion considered to have had "as great an influence on ballroom dancing as did the founding of the Academie Royale de Danse by Louis XIV of France on the ballet" (Silvester, 1990; p. 39). First Committees of the new branch had the task to prepare the syllabus of the examination the new candidates for admission as ballroom dance teachers had to pass. Decades of work resulted in technique book, written by Alex Moore in 1948 and has been revised and updated into the latest 10th edition (The Ballroom Technique, 1994). The 'English Style' of ballroom dancing passed the old ballet technique and the 'Modern' technique was based entirely upon natural movement. As a result of the Ballroom Committee members' efforts the set laws that govern ballroom dance subtleties as body sway, contrary body movement or rise and fall "today the technique of ballroom dancing is as precise as that of the ballet" (Silvester, 1990, p. 40).

Technique formed by the ISTD set the basis for both social and competitive ballroom dancing. With the introduction of the Latin American dances in 1950s the new technique books were written: most notably the Technique of Latin dancing in 1961 by Walter Laird (2003) and Technique of Ballroom dancing in 1976 by Guy Howard (2002). The books are the foundation for the ballroom dancing teachers' education and examination at the International Dance Teachers' Association (IDTA). The technique books for separate Latin-American dances at the ISTD soon followed in 1974 (Latin American cha cha cha, 2003). Ballroom dance competitions gained worldwide popularity and national championships were held in most European, Asian and American countries.

As the father of the ballroom technique Alex Moore wrote in one of his many books: "This international interest, achieved without very much publicity, is the natural result of the recognition of English Ballroom Dancing as the greatest indoor sport and recreation the world has ever known" (Moore, 1986, p. 1). The recognition of the competitive ballroom dancing as sport activity resulted in formation of two international dance organisations, responsible for governing rules and regulations of international dance competitions, educating and examining dance adjudicators, organising major championships and form world rating lists: International Council of Ballroom Dancing – ICBD (today World Dance Council – WDC) and International Council of Amateur Dancers – ICAD (today World DanceSport Federation – WDSF). They both operate as associations of national dance organisations and were formerly distinct by professional and amateur members. Today they both govern professional and amateur competitions and are mostly distinct by WDC emphasising its artistic nature and tradition, and WDSF pointing out its sport side by promoting Dancesport as potential Olympic sport with updating adjudication system and competition dancing technique (Sietas et al., 2013). Šifrar and Kajtna (2014) sum both worlds by stating that Dancesport is a sport discipline that interweaves both artistic and sport components. It is the reflection of the human psychological and spiritual dimensions and enables the development of a dancer's comprehensive, versatile and creative personality. Dancesport competitions are held in two separate disciplines: five modern ballroom (or standard) dances (English waltz, tango, Viennese waltz, slow foxtrot and quickstep) and five Latin American dances (samba, cha cha cha, rumba, paso doble and jive). Some competitions include combination of all ten dances.

Levels of Difficulty

The technique books of ballroom dancing regulate the correct execution of basic steps. They precisely define the Line of dance, Movement directions, Alignment, Couple positions, Leading and following (Partnering), Footwork, Rhythmical structure (Timing), Pose, Hold, Head positions, Foot positions, Movement actions, Amount of turn, Hip actions etc. (The Ballroom Technique, 1994; Howard, 2002; Laird, 2003; Latin American cha cha cha, 2003; Sietas et al., 2013). The technique books define the basic figures. They are named and described in chart form with notes on variations and a list of figures that precede and follow the described figure. The basic figures are also classified into groups, which is of most importance for our study. The groups can be interpreted as levels of difficulty, as the knowledge of the listed figures is expected for the degree of an examined dance teacher or adjudicated dance competitor. The groups are named after the levels of professional teaching qualifications (Associate, Licentiate (Member) and Fellow) (The Ballroom Technique, 1994; Howard, 2002; Laird, 2003) and are identical to the competition groups of amateur dance couples, who are starting as novice competitors. The beginners' class competitions are traditionally held in three groups: Bronze, Silver and Gold level (Wright, 2005). Choreographies must be composed only of figures that are listed in the competition Syllabus. The restrictions in choreographies are reasonable since the technique can only be properly mastered by practicing the most basic figures, adding more difficult figures only on the correct execution of Actions, Amount of turn, Footwork, Partnering etc. The ISTD adds another level to the list – the Student-Teacher level or Pre-Bronze (also Bronze 1) as the most basic level of professional teacher or competitor dancer (The Ballroom Technique, 1994; Wright, 2005; Syllabus outline of Latin American dance faculty qualifications, 2017). There are also many proposed choreographies for each dance at a certain difficulty level. The WDSF competitions restrict choreographies only on the basic level. All defined basic figures can be danced from the start and there are no difficulty levels of basic choreographies officially prescribed (WDSF Syllabus, 2017). The difficulty levels in some dances are offered as a guide for teachers and choreographers to correctly guide their students through mastering the basic technique before adding too difficult figures into their dance routines (Nagode Ambrož, 2010).

Purpose and goals

The groups of basic figures listed at a certain professional teaching qualification level by the IDTA and ISTD are not the same. There are quite substantial differences between the two classifications. The IDTA classification defines 3 categories whilst the ISTD defines 4 levels. There are several figures that are not classified by IDTA and quite few figures that differ in classification for more than just one level (while the IDTA considers them as the easiest, the ISTD classifies them as difficult and vice versa). There is also no clear explanation given on how the figures have been classified into categories. The methods for the basic figures classification are not described. We believe that the classifications were made subjectively without a study of figures' true difficulty. For decades the ballroom dance competitions for beginners have been organised considering the above classifications, taking into account the principle of graduality in developing choreographies. But can this principle really be achieved if the figures that are being danced by beginners are essentially too difficult for them?

The goal of our study was to create an objective method for ballroom dancing basic figures classification, based on statistical analysis of figures' definitions. We have conducted the statistical classification on the basic figures of Latin-American dance Rumba and tested its validity by comparing it to existing classifications.

METHODS

Sample

The analysis was performed on 34 basic figures of Latin-American dance Rumba, as defined by Walter Laird (2003, 1997) and ISTD (Latin American rumba, 1998). The figure classification was conducted using the figures' basic definitions. No Alternatives or Developments were included into analysis.

Variables

The variables used in this study were based on study of Rumba dance by Barbara Nagode Ambrož (2010). The variables' values are mostly defined by the definition books by Laird (2003, 1997) and ISTD (Latin American rumba, 1998) or were defined differently as described below.

1. Number of steps

Each figure is defined step-by-step. The figure is usually longer (takes more time to complete) when there are more steps defined, however, there can be more steps in one bar of music when rhythmical syncopation is used. All the figures in our analysis were defined in basic rhythmical structure [2]-[3]-[4-1] with 3 steps per bar per dancer so there was no Rhythmical variability between the figures. Because of this, the Number of steps variable also includes the information of the Duration of the figure. The value of the variable Number of steps was a sum of steps defined for man and lady combined (lowest value being 6 and highest 24 steps).

2. Amount of turn

Each step of the figure is defined by the precise Amount of turn (Latin American rumba, 1998) or Body turn (Laird, 2003). The terms are synonyms and are understood as body rotation around sagittal axis on standing foot. The value is defined for each step as a fraction of 1 complete turn (360°). There can be different amount of rotation defined for man and lady, so the value of the variable Amount of turn was a sum of rotations made through the figure by both man and lady. The smallest value was 0 (no rotation in the figure) and the highest value 4.25 (4 complete turns and a quarter, or 1530°).

3. Number of actions

Actions, defined by Laird (2003) are foot, movement, and rotation techniques that allow us to perform a certain dance step. Actions are named (for example: weight transfer in place, forward walk, side cucaracha, delayed walk etc.) and can be repeated many times during the figure. The value of the variable Number of actions was a count of different actions including steps for both man and lady regardless of the number of repetitions of a single action. Smallest value was 1 action and highest was 11 actions per figure.

4. Difficulty of actions

Actions (defined by Laird, 2003) have no definition on their difficulty so we used the recommended classification of actions' (or action combinations') difficulty by Nagode Ambrož (2010). Nagode Ambrož's actions classification describe 3 levels. On level 1 the actions used are: weight transfer in all directions (in place, forward, backward sideways), part weight transfer (cucaracha), change of direction (checked forward walk, back basic) and forward walk turning into weight transfer in place. On level 2, the additional actions used are: forward walk turning into checked forward walk (or into backward walk), spiral turn, spin, swivel, and delayed weight transfer. On the highest level 3 the following actions are added: counter rotation and continuous turning. Some of the actions (or combinations), described by Nagode Ambrož (2010) are not described in original definitions by Laird (2003) or ISTD (Latin American rumba, 1998) so the value of the variable Difficulty of actions was determined by the presence of the most difficult action performed either by man or lady. If there was at least one action at the 2nd level, the variable was assigned the value 2 (same for the level 3). If all the actions in the figure were in the 1st level, the value was 1.

5. Symmetric or asymmetric figures

We have defined the symmetry of the figure by analysing the steps by man and lady. If the steps, danced by lady were a mirror opposite of the steps, danced by the man, with the same rhythm, the value of the variable was set as Symmetric. The Asymmetric value was assigned when the steps of the man and lady differ. The hold is usually open and the freedom of movement is allowed for both of the dancers. Lead and follow of asymmetric figures is also different.

6. Number of positions

Both Laird (2003) and ISTD (Latin American rumba, 1998) define the starting and finishing position including the shaping that defines the positions during the figure. The possible positions like close hold, open position, (open) promenade position, (open) counter promenade position, (open) fallaway position, fan position, shadow position etc. were counted (how many different positions are mentioned in a definition of the figure). Most of the figures are defined by 1 or 2 different positions. Only two figures have 3 different positions defined and that was also the highest value of the variable Number of positions.

7. Progressive or static figures

We have defined the progressiveness of the figure as change of place or position on the dance floor. For a figure to be recognised as Progressive, the places on the beginning and in the end of the figure had to be different (the couple has moved across the floor, finishing the figure on different place where they have started), or the positions on the beginning and the end of figure were different (the couple hasn't moved on the floor, but one of the dancers changed position according to the partner). The figures where the couple had moved along the floor during the figure, but finished it on the same place and in the same position as they have started it, were defined as Static figures.

Data processing

In order to investigate the difficulty structure of dance figures we performed a hierarchical cluster analysis with Ward method using squared Euclidean distance as proximity measure and visualising the structure with dendrogram. Schwarz – Bayesian criterion was used to select the model with the best number of clusters. We also conducted the discriminant analysis to find out the importance of each variable in discriminating the groups of figures. The measure of discrimination was Wilks' lambda and centroid equality was tested using chi squared test. Finally the difficulty coefficient was calculated for each figure, using pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions. Statistical package IBM SPSS ver. 23 was used to perform the statistical analyses.

Results

Descriptive statistics for each basic figure of rumba on each of the seven variables (Number of steps, Amount of turn, Number of actions, Difficulty of actions, Asymmetry, Number of positions and Progressiveness) are presented in table 1.

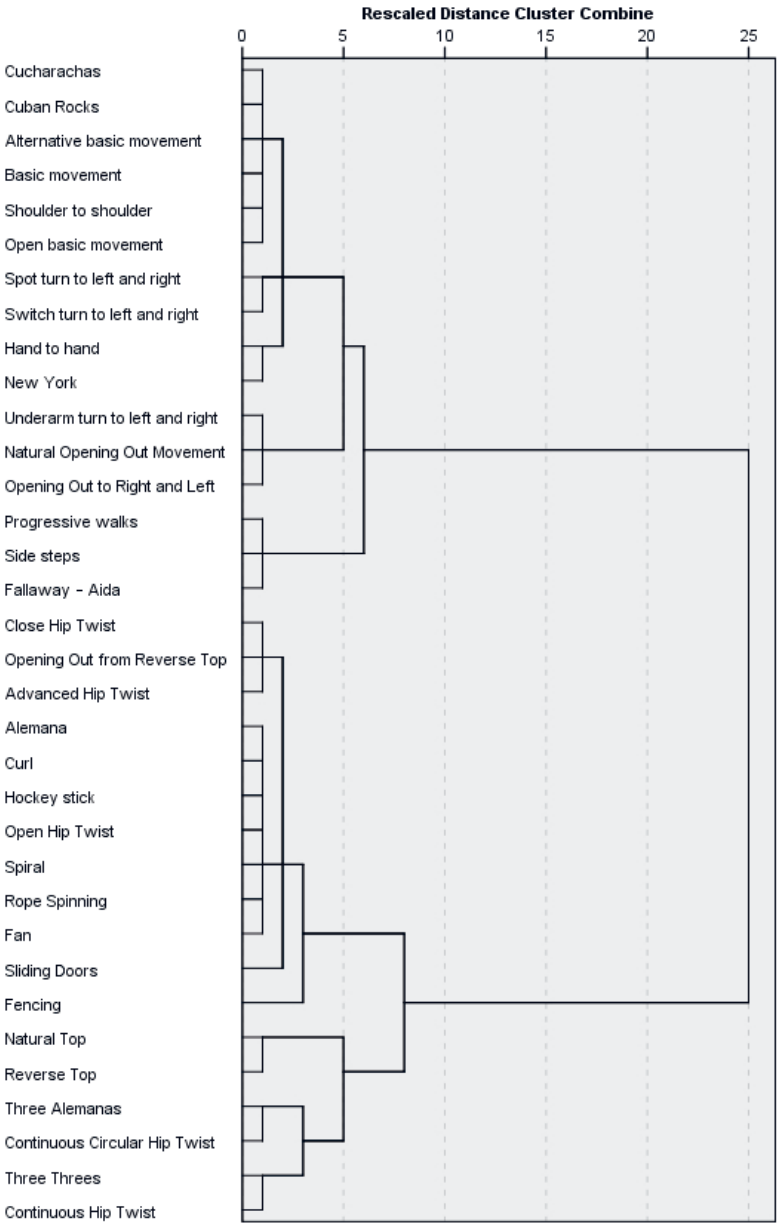
Table 1. Descriptive statistics for the 34 basic figures in Rumba.

Figure	No steps	Am turn	No actions	Difficulty act.	Asymmetry	No positions	Progressive
Basic movement	12	0,5	5	1	0	1	0
Open basic movement	12	0	5	1	0	1	0
Alternative basic movement	6	0	3	1	0	1	0
Progressive walks	12	0	1	1	0	1	1
Cucharachas	6	0	1	1	0	1	0
Side steps	12	0	2	1	0	1	1
Hand to hand	12	2	3	1	0	2	0
Shoulder to shoulder	12	1	5	1	0	1	0
New York	12	1,5	3	1	0	3	0
Spot turn to left and right	12	4	2	1	0	1	0
Switch turn to left and right	12	4	2	1	0	1	0
Fallaway – Aida	6	0,5	1	1	0	1	1
Underarm turn to left and right	12	2,125	6	1	1	1	0
Cuban Rocks	6	0	1	1	0	1	0
Fencing	12	1,25	7	2	0	3	1
Sliding Doors	24	0,5	9	1	1	2	1
Three Threes	24	3,25	10	3	1	2	0
Fan	6	0,5	4	2	1	2	1
Hockey stick	12	0,75	6	2	1	2	1
Alemana	12	1,25	6	2	1	2	1
Three Alemanas	24	4,375	11	3	1	2	1
Natural Opening Out Movement	6	1	4	1	1	1	0
Opening Out to Right and Left	12	1	4	2	1	1	0
Close Hip Twist	12	1,75	7	3	1	2	1
Advanced Hip Twist	12	2,75	8	3	1	2	1
Open Hip Twist	12	1	7	2	1	2	1
Continuous Hip Twist	12	2,625	8	3	1	1	0
Continuous Circular Hip Twist	18	4,25	10	3	1	2	1
Spiral	12	2,5	7	2	1	2	1
Curl	12	1,5	6	2	1	2	1
Rope Spinning	12	2	4	2	1	2	1
Natural Top	18	4,5	3	3	0	1	0
Reverse Top	12	3,25	6	3	0	1	0
Opening Out from Reverse Top	12	2,5	6	3	1	2	1

Asymmetry: 0 the figure is symmetric, 1 the figure is asymmetric;
Progressive: 0 the figure is static, 1 the figure is progressive.

Using these values the hierarchical cluster analysis was performed and the results are presented in figure 1. The dendrogram shows a clear 2-cluster structure but a 3-cluster solution is also plausible. The figures Natural Top, Reverse Top, Three Alemanas, Continuous Circular Hip Twist, Three Threes and Continuous Hip Twist seem to form an additional cluster that is distinct from the 2nd cluster which includes 12 figures with high proximity. To satisfy the condition of objectivity, we tested the 2- and 3-cluster solution with Schwarz – Bayesian criterion. The calculated average silhouette of cohesion and separation for 2-cluster model was 0.51, which is considered as good (Kaufman and Rousseeuw, 1990) and the value for 3-cluster model was 0.39, which is considered as fair. Both 2- and 3-cluster solution fit well to the data but the 2-cluster model has the most optimal ratio.

Figure 1. Results of the hierarchical cluster analysis (dendrogram) with classifications by ISTD, IDTA and WDSF. Difficulty coefficient was calculated using structure weights presented in table 2.



	Classification			Difficulty
	cluster	ISTD	IDTA	WDSF	
Cucharachas	1	1	1	1	2,651
Cuban Rocks	1	1	–	1	2,651
Alternative basic movement	1	1	–	1	3,525
Basic movement	1	1	1	1	5,807
Shoulder to shoulder	1	1	–	1	5,919
Open basic movement	1	1	–	1	5,695
Spot turn to left and right	1	1	1	1	5,280
Switch turn to left and right	1	1	–	1	4,832
Hand to hand	1	1	1	1	5,567
New York	1	1	1	1	5,753
Underarm turn to left and right	1	1	–	1	6,962
Natural Opening Out Movement	1	2	–	2	4,540
Opening Out to Right and Left	1	2	2	2	6,456
Progressive walks	1	1	–	1	4,253
Side steps	1	1	–	1	4,690
Fallaway - Aida	1	3	3	2	3,069
Close Hip Twist	2	2	1	3	9,159
Opening Out from Reverse Top	2	3	–	3	8,890
Advanced Hip Twist	2	4	3	3	9,820
Alemana	2	2	1	2	7,990
Curl	2	3	2	2	8,046
Hockey stick	2	2	1	2	7,878
Open Hip Twist	2	3	1	2	8,371
Spiral	2	3	2	2	8,707
Rope Spinning	2	3	3	2	7,284
Fan	2	2	1	2	5,652
Sliding Doors	2	4	3	2	11,105
Fencing	2	4	–	2	8,371
Natural Top	2(3)	2	1	3	8,365
Reverse Top	2(3)	3	1	3	8,100
Three Alemanas	2(3)	4	3	3	14,087
Continuous Circular Hip Twist	2(3)	4	3	3	12,326
Three Threes	2(3)	4	–	3	13,092
Continuous Hip Twist	2(3)	4	3	3	9,188

The result of the cluster analysis can be compared to the existent classifications of the figures by the ISTD and IDTA. The WDSF column is provided as proposed 3-level guide by Barbara Nagode Ambrož (2010) for choreographers and is not considered as an official classification. All three classifications have at least 3 groups of figures considering levels of difficulty. In figure 1 we can see that the cluster analysis created groups of figures that follow the logic of difficulty levels. In the 1st cluster the grouped figures are mostly considered as simple by the three classifications and in the 2nd cluster the more difficult figures. The probable 3rd cluster is consistent of the most difficult figures, leaving in question the classification of the Natural and Reverse Top as simpler figures by ISTD and IDTA. Our result created the classification that is most similar to the WDSF proposed classification by Nagode Ambrož (2010).

To investigate the importance of each variable on the figure classification we performed a discriminant function analysis, using the 2-cluster solution from the previous analysis. The results are shown in table 2. All the seven variables had significant discriminating value (< .800; p < .007) so we conclude that the variable selection for the analysis was good. Each variable had different power of discrimination which is presented as structure weight in table 2. Difficulty of actions and Number of actions had the highest discriminating power. Number of steps and Amount of turn were the least significant variables. Clear distinction between simple and more difficult figures is seen by all the variable values.

Table 2. Results of the Discriminant function analysis for the 2-cluster solution. Variable comparison, Wilks' lambda and structure weight.

	group 1 (N = 16)		group 2 (N = 18)				structure
variable	M	SD	M	SD	λ	Sig.	weight
No steps	10,13	2,87	14,33	5,10	,790	,006	**,216**
Am turn	,98	1,13	2,25	1,30	,777	,005	**,224**
No actions	3,00	1,67	6,94	2,15	,479	,000	**,437**
Difficulty act.	1,06	,25	2,44	,62	,313	,000	**,620**
Asymmetry	,19	,40	,83	,38	,583	,000	**,354**
No positions	1,19	,54	1,89	,47	,663	,000	**,298**
Progressive	,19	,40	,78	,43	,653	,000	**,306**

Using the structure weights we calculated the difficulty coefficient for each figure (difficulty coefficients are presented in table 1). The equation for the calculation of the coefficient was: difficulty = 0.620*Difficulty of actions + 0.437*Number of actions + 0.354*Asymmetry + 0.306*Progressiveness + 0.298*Number of positions + 0.224*Amount of turn + 0,216*Number of steps. The average difficulty of the 1st cluster was 4.90 and average difficulty of the 2nd cluster was 9.46. All the difficulty coefficients in the 2nd cluster are higher than in the 1st cluster, except for the figure Fan, classified in the 2nd cluster (more difficult figures) with relatively low difficulty coefficient.

DISCUSSION

The existing classifications of basic dance figures in Latin American dance rumba by IDTA and ISTD have respectively 3 and 4 groups of figures that can be interpreted as levels of difficulty. The knowledge of the figures in particular group is expected by the teachers and competitor dancers at a certain level. A 3-level distinction of figures has been engraved into ballroom dancing and has been used for decades. The results of our study showed that a 2-level solution is more viable although a 3-level model was also a plausible solution. The goal of our study was to create an objective method for ballroom dancing basic figures classification, based on statistical analysis of figures' definitions. Testing this method on one Latin American dance (rumba) was proven to be successful as the figures were grouped by their similarity into clear difficulty levels. The classification differs however from the existing classifications. We would argue that the classification of the figures Fallaway-Aida and Fencing is definitely better by our classification. Using a 3-level model the figures' classification in question would be for Sliding doors, Hip Twists and Natural Top. The ISTD classification has been the most widely used at the competitions on Bronze, Silver and Gold levels (Wright, 2005). Revisions, such as the purposed one by WDSF (Nagode Ambrož, 2010), are slowly being accepted by the competitions in the United States and Mexico as WDSF technique books are being incorporated (Syllabus Guidebook, 2016; Repertorio de figuras básicas, 2017). Our classification had most similarities with the WDSF classification. We believe this is a consequence of using variables that Nagode Ambrož (2010) considered as important in her study of rumba figures. Nagode Ambrož's classification is also the first try of objective classification by the figures' difficulty. Our study added the statistical point of view on this topic and resulted in similar results with minor discrepancies (even when comparing the 3-cluster solution).

With statistical analysis we were also able to investigate the importance of each variable on the difficulty of the figure. We were able to define the values of each variable for all basic figures. Most values were calculated from the definitions in the technique books by Laird (2003, 1997) and ISTD (Latin American rumba, 1998) (Number of steps, Amount of turn, Number of actions and Number of positions). The variables Asymmetry and Progressiveness were defined by us and were dichotomous variables. Difficulty of Actions however was defined by Nagode Ambrož (2010) and the values for the 3-levels were taken by her classification. This variable was also the variable with the highest structure weight (highest discriminant value). Since our classification could be considered objective, the objectiveness of this variable is questionable. Different dances like jive, samba and paso doble (or even standard ballroom dances like waltz, tango and foxtrot) all have different actions and difficulty of the actions is not defined by the technique books. Classifications of their difficulty should be made by different experts and even a 3-level classification should be put into question. Since we agree that the difficulty of actions is one of the most important factors in determining the figure's difficulty level, we should first put more effort into examining the actions before we continue to classify the figures of other Latin-American and standard ballroom dances. We also believe that the importance of variables could differ for different dances and distinct formulae should be offered. The Asymmetry and Progressiveness were found to be important in rumba but could be less important in e.g. jive or samba. Progressiveness could also be measured more precisely, especially in standard ballroom dances where majority of figures are progressive.

The difficulty coefficient was calculated using structure weights from discriminant function analysis using 2-cluster solution. The figures show clear distinction between the groups (difficulty levels), and the coefficient can be used for direct comparison of the figures true difficulty. The interpretation should however be used with caution. The difficulty coefficients could be different if we would use standardised canonical function coefficients, predictor importance (cluster analysis) or if we would use the logistic regression instead discriminant analysis. Since there were two dichotomous variables in our analysis, the logistic regression might be a better option. Adding the Alternatives and Developments of the basic figures we could also include more variables into the analysis. This should be considered in future studies.

The figures classifications have the function of gradually gaining the knowledge and skill of ballroom dancing. A good classification should consider the true difficulty of each figure and we can achieve that goal only with an objective approach to the matter. Gradual development should be the main principle of all teachers when creating choreographies for the beginners. We hope that our method and classification can be used as a guide for choreographers and teachers of ballroom dancing worldwide and create a new wave of research to determine the importance of objectively observable factors on dance figures' difficulty.

CONCLUSIONS

The statistical analysis of the rumba basic figures was successful. Based only on similarity, the figures formed groups according to their difficulty.

The 2-solution was found to be the best model fit. This however differs from the existing classifications with 3 or 4 levels. A 3-cluster solution was found to be a good option as well.

Using discriminant analysis we were able to calculate the precise difficulty coefficient for each figure. This can be used to verify and modify the existing classifications or as a guide for choreographers to incorporate the principle of gradually developing choreographies into their professional work.

The limitations of the study were the use of only basic definitions without Alternatives or Developments (this excluded the possible important variable Timing or Rhythmical structure) and not checking the variable Difficulty of actions for objectivity (which should be the first analysis to do in the future). Other statistical methods could be used to test the results of the current study.

LITERATURE

Howard, G. (2002). Technique of ballroom dancing. Brighton: International Dance Teachers Association.

Kaufman, L. and Rousseeuw, P. J. (1990). Finding groups in data: An introduction to cluster analysis. New York: John Wiley & Sons.

Laird, W. (1997). The Technique of Latin Dancing Supplement: Technique for the British Dance Council's, Appendix 1. (Latin) figures. Brighton: International Dance Teachers Association.

Laird, W. (2003). Technique of Latin dancing. Brighton: International Dance Teachers Association.

Latin American cha cha cha. (2003). London: Imperial Society of Teachers of Dancing.

Latin American rumba. (1998). London: Imperial Society of Teachers of Dancing.

Moore, A. (1986). Ballroom dancing. London: A&C Black.

Nagode Ambrož, B. (2010). Rumba – basic syllabus (DVD). Sant Cugat: International Dancesport Federation.

Repertorio de figuras básicas. (2017). Ciudad de México: Federación Mexicana de Baile y Danza Deportiva. Retrieved from http://www.femexbaile.com.mx/descargas/2017/Syllabus.pdf.

Sietas, M., Ambrož, N., Cacciari, D., Cacciari, O., Bosco, F., Ferrari, M., Guerra, R. and Benincasa, G. (2013). Waltz. Sant Cugat: World DanceSport Federation.

Silvester, V. (1990). Modern ballroom dancing. London: Stanley Paul.

Syllabus guidebook. (2016). Cape Coral Forida: USA Dance. Retrieved from http://documents.usadance.org/governance/rules-policies-and-bylaws/1bawchvcny/.

Syllabus outline of Latin American dance faculty qualifications. (2017). London: Imperial Society of Teachers of Dancing. Retrieved from https://www.istd.org/about-us/documents/latin-american-syllabus-outline/latin-american-syllabus-april-2017.pdf.

Šifrar, T. and Kajtna, T. (2014). Osebnostne dimenzije, čustvena inteligentnost in socialne spretnosti plesalk in plesalcev v športnem plesu. Ljubljana: Fakulteta za šport.

The Ballroom Technique. (1994). London: Imperial Society of Teachers of Dancing.

WDSF Syllabus. (2017). Sant Cugat: International Dancesport Federation. Retrieved from https://www.worlddancesport.org/Document/19053767635/WDSF_Syllabus.pdf.

Wright, S. (2005). ISTD international Latin ballroom dance syllabus. Washington DC: Georgetown University. Retrieved from http://www.wright-house.com/dance/istd-international-latin-syllabus-ballroom-dance.html.