

Rhythm capacity: Comparison between professional dancers and dance students

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We all have the intuition that different rhythmic factors and different people exhibit different rhythmic behaviors. A sample of professional dancers and university dance students was recruited for this study. Our methodology was based on the application of a specifically built and validated set of questionnaires. This battery of tests was previously applied to young people practicing dance. In the present study, we found no significant differences between the rhythmic factor or synchronization, or between male and female participants. However, when the rhythmic factor involved the reproduction of particular moves, significant differences were found.

Keywords: dance; rhythmic capacity; rhythm factor; rhythm test; structure

Rhythmic behavior in dance is very important. We understand rhythmic behavior as the main point of technical quality and expressive quality (Batalha 2004). In dance, by rhythmic structure we mean the organization of the time and intensity of performance. However, we must stress that the time component is fundamental. While the intensity component is always present marking the structures in a more qualitative manner than the time forms, the time component is of extreme importance for the artistic, expressive, and communicative aspects because it affects the dynamics of emotions, which are reflected in the dance.

In this paper, we present working tools in the area of rhythm and demonstrate that it is possible to quantify rhythmic capacities. Batalha's (1986) battery of rhythm tests has previously been validated, capable of evaluating and analytically studying its components, denominated as rhythmic factors. It can be presumed that different rhythmic factors and different people exhibit different rhythmic behaviors, but few studies have

been devised to understand how it is possible to quantify rhythmic motor capacity.

We accept that rhythmic structure is the organization of the temporal and intensity components (Hiriartborde and Fraisse 1968). Analyzing the temporal component is fundamental in motor behavior, but the intensity component may be even more important because it brings out the expressive quality. The intensity structure is essential in the artistic performance, for expression and communication, because it shows the emotional dynamics of the dance.

Improvement in the quality of movement is associated with optimization of the motor representation and with the discrimination of the rhythmic components aroused by the motor activity. Motor development aimed at effective motor control occurs when all the phases are carefully analyzed, with respect to their components and the final product desired.

Whether at the level of motor learning or at the higher level of high performance in dance, there is reference to the mental representation of a movement. This by itself justifies the systematic and detailed analysis of the motor and expressive variables.

Noteworthy is the importance of the mental representation of movement for the following reasons: to facilitate memorization of the actions, to anticipate action (allowing not only the prediction of their effect but also their precise execution), to favor the self-correction of the actions; to promote a good communication, to reach a good performance, to understand the choreography, and to evaluate the message.

The aim of this study was to understand how young professional dancers and university dance students respond to different types of rhythmic stimulus. We compared professional and university-level dancers in terms of rhythm capacity to find differences promoted by the regular practice of dance.

Rhythmic structures (RS)

Historical analysis of motor activities demonstrates that rhythmic structure is an operational constant of motor learning (Batalha 1986, 2001, 2004). Considered as a step in motor development, the quality of movement depends essentially on the contrast in dynamics and timing. Rhythmic intellectualization plays an important role in the learning of routines, given that the rhythmic components are responsible for that quality.

The ideal motor execution, the coherence of motor communication, and aesthetic equilibrium can only be created if a minute analysis of the rhythmic involvement is carried out.

A better understanding of the rhythmic phenomena involves the organization and structuring of the variables inherent in the rhythmic structures (RS), which permit not only self-organization but also the development of purposeful tasks.

Reflecting upon the importance of rhythmic structures in artistic performance, we come to the conclusion of the necessity of discriminating selection of the *temporal* and *intensity dominants* according to their structuring units in order to allow for *superior motor quality* and *efficient communication*, based on mental representation and prior programming.

Dance communication uses message-reinforcement, making use of the intensification of actions, which is the control in this case, to the highest level of sophistication, intensity, and duration of muscular contractions.

For a better understanding of the rhythmic aspects of motor function, and to permit specific forms of intervention in artistic performance, we classify RS according to their components as follows:

- Intensity: when they depend of the accentuation of sharp and soft muscular contractions
- Temporal: according to the duration values of the intervals between the movements and the duration of the contractions as short or long

In both situations, and with respect to motor activity, these structures may be observed and analyzed in:

- Supports: through the quality of weight transfer which is reflected in intensity and temporal aspects
- Body: (center) through the set of muscular degrees of tension which take place within a certain time and with a specific intensity (Thackray 1969).

In summary, rhythmic structure is a group of timing and intensity phenomena. The rhythmic structure is essential in performance skills and communicative projects.

General rhythmic motor capacity (GRMC)

These propositions permit not only the understanding of reasons for analyzing rhythmic structures (Fraisse 1956, 1967, 1974), but also the importance of the concept of general rhythmic motor capacity (GRMC; Batalha 1986).

Being unable to formulate a duly tested concept of GRMC, we studied rhythmic factors which correspond to response models and cover both symbolic and motor forms of expression, while integrating the time factor of the moment of response in relation to the stimulus. Our preference fell on motor responses to rhythmic stimuli, considered as expressions of a rhythmic profile characteristic of our area of study: dance.

Rhythmic factors were thus selected in relation to the observable behaviors and the level of processing of the responses, using the research of Fraisse (1956, 1967, 1974) as a point of departure. Thus, we identified general rhythmic motor capacity based on factors whose dimensions are observable behaviors (Le Boulch 1964, Batalha 1986).

Each individual has the capacity to synchronize the rhythmic stimuli of a certain model, either through fine movement or through global movement with footwork or walking. We distinguish three factors of the GRMC:

1. Transcription, which is of a perceptive nature, is based on the discrimination of successive rhythmic structures and its graphic symbolization.
2. Synchronization, corresponding to motor expression synchronized with rhythmic stimulus, is based on previously perceived and memorized rhythms. Stimulus and response are performed simultaneously.
3. Reproduction is a performing situation of motor response complying with the model after the issue of the signal. The performance follows the stimulus.

METHOD

Participants

This study was part of a larger survey and was developed in the region of Lisbon. Being based on Batalha's (1986) battery, a sample of professional dancers from the professional company Ballet Gulbenkian and students from the dance department of the Technical University of Lisbon were recruited. Our methodology was based on the application of a specifically built and validated battery of tests. This allowed us to compare objectively the rhythmic behaviors of two groups (professional dancers and dance students) and two sub-groups (men and women).

The sample was composed of 22 professional dancers between the ages of 18 and 24, and 22 dance students from the university, in the same age range.

Materials

The test used was composed of three parts:

1. Transcription of rhythmic structures (temporal, intensity): perception of three rhythmic sound structures and respective symbolization. Each individual must perceive the rhythmic stimulus, recognize it as a structure, and symbolize it graphically.
2. Synchronization with a rhythmic structure: adjustment of the motor response to the elements of the model. Synchronization is characterized by anticipating the rhythmic adaptation of the responses through the continuous search for synchronization with a rhythmic structure or musical sequence.
3. Reproduction of a rhythmic sound structure and of a movement sequence: perception of a rhythmic structure and execution with hands and feet of the same structure after the rhythmic stimulus; and perception of a sequence composed of four different rhythmic structures for execution through the basic locomotive movements of that sequence after the rhythmic stimulus. This level of response, in the execution of motor performances, calls the memory into operation.

Procedure

The rhythmic stimuli were registered and always performed in the same way. For the application of the tests, we asked each dancer to respond individually in their normal working studio. The tests were always administered by the same researcher.

RESULTS

In this study, we found few differences between professional dancers and dance students, or between male and female participants. Concerning transcription, professional dancers demonstrated slightly higher results, though the difference was not significant. The same was found in synchronization. Regarding reproduction, professionals displayed a significantly higher level of performance.

From this study, we conclude that there are no significant differences between gender, or the two groups, except in the reproduction of particular moves.

DISCUSSION

In conclusion, we understand that regular training in dance develops the capacity for rhythmic reproduction. The lack of studies in this area induces us to some prudence in the possible overall conclusions. We did observe, however, that the professional group was much more apt at reproducing the structures. Given that this capacity entails a large component of memory, it could be said that the practice of dance is a good way of training memory.

We close with the fact that this work demonstrates that it is possible to quantify general rhythmic motor capacity (GRMC) and that the test battery presented is a tool capable of evaluating and analytically studying the component factors, establishing inter-relationships which can help explain individual behavior.

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