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Dances of Cape Verde: Tempo, preferences, and entrainment

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Dance is a complex activity, and it gets more difficult when you have to dance with someone. The dancer must be in time with music and in time with the other or others. The entrainment concept has an important role in this case. Why do we prefer to dance with a specific dancer over another? In this study, we sought to find out who dancers prefer to dance with and the reasons for that choice. The studied variables were experience, morphological characteristics, and spontaneous motor tempo. The results indicate the importance of dance experience in preferences, a lack of influence of anthropometric characteristics in these choices, and a tendency to choose partners with a higher spontaneous motor tempo.

Keywords: dance; entrainment; preferences; spontaneous motor tempo; walking

The ability to entrain is observable in many occasions of human life, for example to adjust a speech rhythm in a conversation or to "keep pace" while walking with someone. In dance activities this capacity is crucial. Dance can be considered a complex motor activity as it involves dynamic processes of synchronization to sound stimuli and adaptation of the motor behavior of a dancer. The dancer must be in time with music and in time with the other (couple dancing) or others (group dancing). In dance history, there are some couples that appeared to have a perfect synchronization of movement—for example, Rudolf Nureyev and Margot Fonteyn.

From the point of view of dance training, this is an extremely important capacity for success. In sport-dance (ballroom competition, for example), one of the reasons for success seems to be the right choice of the pair. There is a long literature on the tradition of entrainment and synchronization of movements (Clayton *et al.* 2004, Styns *et al.* 2007) with light or sound stimuli but

using tasks such as tapping (Repp 2005) or clapping. Dancing involves more complex motor tasks and introduces new methodological problems.

Nevertheless, this capacity is little studied in dance, and maybe because of this, it is not incorporated into traditional dance training programs. Côté-Laurence (2000) suggested that understanding the processing of rhythmic elements and the control of synchronization may facilitate ballet training.

In my opinion, there are the two types of issues responsible for the lack of studies on dance entrainment: *conceptual* as it exists in the literature and in practice some confusion about what motor rhythm is and its relationship with the musical rhythm, and *methodological* that relates to the difficulty to quantify the variables related to human movement in general and in dance in particular.

In this study, I applied a new methodology that takes into account the characteristics of the dance movement to study specific dance tasks (ecological approach). The problem was to identify the motor rhythm of each dancer and then know whether this feature (preferred tempo) is influential in choosing a partner to interact with in the different dances. As a starting point, I wanted to know if morphological characteristics (length of lower limb, for example) had some influence in the choices, in addition to experience in dance and performance tempo.

METHOD

Participants

The sample consisted of 14 (7 female, 7 male) professionals of traditional dances from the islands of Cape Verde, which performed five shows a week in one of the hotels on the Sal Island. The average age was 24.85±4.07, with a minimum of 20 and a maximum of 31 years. The average weight was 61.88± 6.05 kg, and the weight ranged from 49.4-71.9 kg. The average height was 168.51±5.86 cm, with a minimum of 158.6 and a maximum of 178.4 cm. For the Body Mass Index (BMI), the average value was 21.77±1.55 with 19.2 and 24.5 for minimum and maximum values, respectively. The average years of experience in dance was 5.35± 3.95. Half of the group had over (15, 11, 8, 8, 5, 5, 5) and the other under (4, 4, 3, 3, 2, 1, 1) five years of experience. The older dancers had worked in the institution for seven years, and the youngest had been integrated into the group since then. The traditional couple dances are part of their daily lives and interactions between different members of the team are common.

Materials

For this study, I used a metronome and a camera. Anthropometric measurements were made using the following instruments: a weighing scale (SECA), an anthropometric tape (Rosscraft), a skinfolder caliper, and a segmometer.

Procedure

Collections were held in the conference room of the hotel. Anthropometric measurements and body composition followed the protocol of ISAK (International Society for the Advancement of Kinanthropometry). In the first part of the study, participants were asked to dance each of the four dances of Cape Verde (*Koladera*, *Funaná*, *Mazurka*, and *Kolá Sanjon*) in front of a camera without any sound or visual stimulus. These recordings were used to characterize the real spontaneous motor tempo (rSMT) (see Eerola *et al.* 2006).

I then played several tempos on the metronome and each participant chose the value that was the most comfortable for him/her in the various dances. This part of the study was also recorded on video and was used to characterize the perceptive spontaneous motor tempo (pSMT). These first collections were realized individually with only the subject and the researcher in the room.

In a second phase, with the whole group in the room, everyone was asked to dance each of the four dances with everyone else. This task was repeated on three different days. Interviews were conducted on a different day to find out with whom the dancers preferred to dance.

The most comfortable or preferred walking tempo was also asked and measured. Each dancer took the digital metronome while they were walking home and adjusted the metronome to the rhythm of his/her walk.

Three observers identified the tempo used by each dancer by watching the collected images and adjusting the metronome to it. One minute of each dance was recorded so that the dancers had time to stabilize the structure of the performed steps (*self-entrainment*, see Clayton *et al.* 2004). It was found that 45 seconds was enough to obtain a stabilized structure of the supports that allow expression in beats per minute (bpm). I repeated the observations on three different days (intra-observer agreement), and these data were confirmed by two different observers (inter-observer agreement).

RESULTS

Regarding preferences, I found that no one ever chose the same pair for the four dances. Three subjects chose two different people, nine chose three, and

Table 1. Real spontaneous motor tempo (rSMT), without metronome, and tempo preferred for walking.

	Koladera	*Funaná*	*Mazurka*	*Kolá Sanjon*	*Mean*	*SD*	*Walking*
F1	120	133	120	105	119.50	11.44	110
F2	115	135	120	115	121.25	9.46	111
F3	120	135	118	120	123.25	7.89	113
F4	128	140	120	128	129.00	8.24	120
F5	125	145	120	128	129.50	10.85	110
F6	120	138	115	115	122.00	10.92	104
F7	123	135	115	115	122.00	9.45	115
M1	107	130	110	120	116.75	10.43	110
M2	128	145	120	125	129.50	10.84	115
M3	115	127	118	117	119,25	5.31	110
M 4	112	143	115	120	122.50	14.05	110
M5	118	135	115	115	120.75	9.60	113
M6	115	130	115	112	118.00	8.12	117
M7	110	125	112	105	113.00	8.52	101
Mean	118.07	135.43	116.64	117.14	-	-	111.36
SD	6.28	6.28	3.27	7.13	-	-	4.88
CD	121	155	122	127	-	-	-

Note. F=female dancer, M=male dancer, CD=performance music (bpm).

two chose four different people; this means a different partner for each dance. The mutual choices were only 10 out of 28 possible (35%) with the following distribution: 4 in *Kolá Sanjon*, 3 in *Koladera*, 2 in *Mazurka*, and 2 in the *Funaná*.

There was a clear tendency for the choices of individuals with a rSMT superior to theirs, with 62.50% of choices, while 30.36% chose subjects with less rSMT, and 7.14% chose subjects with the same rSMT.

Comparing the rSMT (real) with the pSMT (perceived), in the overwhelming majority of the cases there was a tendency to dance with the metronome higher than the motor time performed without any stimulus. This difference is even greater when comparing these two values (rSMT and pSMT) with the music tempo (bpm) used during the performances, as can be seen in Table 1.

No significant correlations were found between anthropometric variables, body composition and partner choices. The height, BMI, the somatotype

(ecto-, meso-, or endomorph), or the length of the lower limb did not appear to be associated with the choices of the pair.

The results show great evidence that the choices of the dancers are mainly guided by experience: 47 in 56 of the choices, or 83.93%, are from the group with more experience, which means more than 5 years of professional experience.

Note that the male dancer and the female dancer with more choices (three each) in the faster dance (*Funaná*) have higher values of rSTM. On the other hand, in the slower dance (*Mazurka*) the chosen dancers have the lowest values of rSTM. The same applies for the female dancer chosen in *Koladera*, but not for the male dancer (too fast for a slow dance). At *Kóla Sanjon* dance, as four reciprocities in seven were found, the distribution of preferences is more balanced, and this logic cannot apply.

With regard to walking, chosen as the reference standard tempo of each person, the values found for the dances are slightly higher if we take into account the average rSMT. The *Funaná* lies clearly above (it is close to running pace), while the other three dances are slightly above the favorite walking tempo of each dancer. The *Morna*, another Cape Verde dance that was not used in this study because it is not danced in the performance, is clearly below the tempo of walking, with an average of about rSMT 32.50±3.25 bpm.

DISCUSSION

It seems to be evident that the influence of sound stimuli, whether of a metronome or music, increases motor tempo. Moelants (2003) finds that in music for dance, a higher tempo than in natural tempo, "this can be related to the need for a certain 'excitement' in dance music, more than in 'listening music'" (p. 652). The data found in this study confirm that the own motor tempo "accelerates" in the presence of a metronome and even more with the presence of music during the performance.

About the adaptation to the other, there was a preference for dancers that were naturally faster, in the sense of having an rSMT superior to theirs. This choice can be considered intelligent because during the performance they will have to dance to a faster time than their natural, spontaneous time.

More studies are needed to confirm the tendency that the faster dancers are chosen preferably for the faster dances (as was found in *Funaná* either for the first male dancer or the first female dancer for the ranking of the most chosen) and that the slower dancers are the most chosen for slower dances (as was found in the *Mazurka*, the same as above).

In summary, there was a tendency to select partners with more experience and a tendency to prefer those with higher levels of rSTM, and who were therefore faster.

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