Introduction

Dancers have spent years willing to accept metaphorical and transient teaching methods as the lone mechanism for improving performance. Advancements in technology have made it possible to analyze dance form and technique with data and numbers to distinguish right from wrong. The purpose of the study is to compare differences in professional level ballroom dancing with less trained and skilled ballroom dancers. The first application of this study is focused on Rumba Walks, the basis of one of the five International Latin Dances.

Purpose

The purpose of this study is to produce quantitative information for dancers about their bodies in dance right now through motion capture software. With information about joint weaknesses, misalignment, or faulty body positioning, compared from professionals to young children, each dancer will be able to alter their dancing at a rapid rate as science and art combine in unison.

Methods

Four male and four female Latin dancers (IRB approval and informed consent obtained) within the Junior, Youth, Amateur and Professional categories were studied in the Rumba Walk analysis chapters of this study. Dancers performed three trials of Rumba Walks, to the competition-tempo music that was consistent between every dancer in the lab. Biomechanical data were collected using a 16-camera Vicon Nexus system (Vicon, Inc., Denver CO) during Rumba walks. Vicon data was transferred into Visual 3D software to access kinematic data.

Coaches with 30 years of experience defined the essential stages of a Rumba walk – a picture line straight legged position, a collection as the leg passes through, and a push off/power position. Joint angles of the ankle, knee and hip were compared between the male and female participants at each stage.

Results

Picture Line Hip Rotation

- Males - Amateur and Professional dancers left hips internally rotated and right hips externally rotated.
- Flexibility exercises - modified lunge or figure four stretch (Bremner et al., 2015).
- Consequence of lack of flexibility - an over-exertion of the less dominant side in order to attempt extra range of motion.

Picture Line Hip Joint Angle

- In males, the Junior dancer very little extension, the Youth and Amateur males very significant extension, the Professional dancer very little extension.
- Age/retirement from dancing competitively, lack of flexibility.

Collect Knee Angle

- "Triangle" position with the moving leg, with the knee at the point of the triangle (Johnson, 2018).
- Knee can’t flex too much, foot must remain on the ground, hips neutral.
- How Collect is compromised and how to prevent.

Power Flexion at Hip Joint

- Line up joint angles before moving leg facilitates rotation at the hip joint in order for the Rumba walks to continue.
- ‘Filling up’ the crease in the hip to achieve a neutral hip position.

Power Knee Angle

- Showed a clear trend favoring the abilities of the more advanced dancers
- External rotation (hip) must occur for Rumba walk to remain fluid. "Settling to move" to achieve fluidity in Rumba walk (Johnson, 2018).

Discussion

- Junior dancers executed Rumba Walk with less proficiency overall than the Youths, Amateurs, and Professionals, in order.
- Professionals most bilaterally similar
- No one will have the same Rumba walk, teachers can target trends
- Significant improvement in young dancers’ Rumba Walks as corrections have been applied based on data collected.

References