

Evolution & Behaviour

Hips don't lie: attraction revealed by dancing body language

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Dancing forms a huge part of human social life, and humans often get together to dance when romance is in the air but what makes a good dancer?

Human courtship is complex, yet we currently know a lot about the physical factors involved in one person deciding that they are attracted to another person. Certain physical characteristics, facial features, and body size and shape have all been extensively investigated, and they each provide key information about the health, and reproductive qualities of the person being viewed.

Movement has been less well-studied, mainly because it is difficult to disentangle other characteristics such as facial attractiveness, and body size and shape when asking people to judge the movements of others. Our team have pioneered a technique which enables us to record movements such as walking and dancing and convert those video clips into featureless avatars which convey the movements exactly, but do not portray any other identifying features.

We then show clips of the avatars walking and dancing and ask males and females to rate them on the characteristics we are interested in, e.g. "how good a dancer is this person?". We record the movements using a hi-tech motion capture system that also enables us to take precise measurements of individual movement parameters in three-dimensions. We can then see which patterns of movements are associated with perceptions of dance quality.

In previous studies we found that good male dancing is signified by larger and more variable movements of the upper body, we then went on to show that such movements provide an honest indication of the physical strength of the male -

stronger males are viewed as better dancers, and interestingly this information appears to be directed more at potential male rivals than it does at potential female partners.

This now brings us to female dance, it is unlikely that female dance quality is based on upper body strength, in fact anecdotal evidence suggests that female movements are viewed in relation to the hips. In our study just published in the journal *Scientific Reports*, we recruited 39 females (none were professional dancers) and asked them to dance to a basic drum beat rhythm. We converted their movements into avatars and showed these to males and females, who were asked to rate each dancer in terms of how good a dancer they were. We found that three movement components were key predictors of dance quality: (i) Greater hip swing (ii) Greater arm movements, that also displayed moderate asymmetry (iii) More asymmetric thigh movements.

In addition, the rhythmicity of the dance was important, better rated dancers strutted their stuff more closely to the beat of the music.

These findings might reveal the biological significance of movements in human mate preferences. For example, moving one's limbs independently with a degree of asymmetry can be difficult, especially when dancing to music, and so this might show to an observer that the dancer has high quality motor control, damage to the nervous system typically results in abnormalities in the movement system and so this is a good way of signaling your neurological health. Hip swing and thigh movements may serve to indicate the degree of femininity, in turn these might also signal your hormonal status. Consistently with that, other studies have shown that female walking patterns change over

the menstrual cycle, with females in a more reproductive phase (ovulation) walking in a more "feminine" and "sexy" manner.

We have taken the first steps in the scientific understanding of what dance movements are seen as optimal, and what these movements might signal to same-sex rivals and opposite sex partners. We can now move forward to try and understand the functional significance of these movements - i.e. what do they tell us about our biological and psychological make-up. On top of that...we will also be able to provide sound advice to enable people to improve their dancing.