Suggestions for a Parametric Typology of Dance

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Dance and language are produced and performed by the body and governed by cognitive faculties. Yet regrettable little scholarship applies the tools of formal analysis from one field to the other. This article aims to enrich the dialogue between the two fields. The authors introduce an approach to dance typology informed by an analogy with the parametric theory of language analysis, which is useful in typologizing languages. This initial exploration paves the way for a physiological typology of dance that does not reference culture.

This work is the collaboration of a professional dancer and dance educator with a linguist who was a student of dance in her youth and returned to dancing after a twenty-year lapse. We noted how dance students apply prior knowledge to a new task, affecting how they carry it out. Something similar happens with language: A second-language learner applies knowledge of a first language and hence makes predictable errors. Our continued discussion led us to a systematic way of connecting observations of dancers’ habits to physical properties of the (moving) body—a typology of dance that uses an approach to language typology as model.

We do not claim that dance is a type of language nor vice versa. It would be silly to demand of a movement event that it have an agreed-upon “meaning” in order for it to qualify as dance [1]. We do not even claim that language and dance “build on a shared cognitive architecture” [2]. We simply recognize that both dance and language have a biological foundation (see supplemental Appendix A; appendixes provided with online version of this article) and the body is their expressive tool; thus applying linguistic methods grounded in biology to the study of dance might reveal insights.

Others have incorporated culture when comparing language to dance (Appendix B). Certainly, the appreciation of a dance tradition demands attention to culture; aesthetic judgments (partially cultural) are made by choreographers and dancers who interpret that choreography, just as, in language, the poet, novelist, storyteller and preacher all make culture-linked choices. Thus the task of analyzing dance is enormous; dance is artistic, philosophical, political and emotional. For this reason, it may be helpful to separate dance into components. One part is physical—the tool is the human body (although it can be augmented by props, lighting, etc.). Dance has a biological foundation. Biological evolution is enormously slower than cultural evolution, and biology transcends culture in that physical considerations limit or allow movement. Therefore, attention first to the physical allows later attention to cultural impositions without confusion of the two. A physical approach may clarify connections among dance traditions around the globe that belong to disparate cultures.

Precisely this has happened with language: Comparisons between distant languages (genetically and culturally) reveal patterns that are free of culture and, in this sense, more basic (Appendices A and C).

In the hope that a parametric approach to dance might offer something similar, this work is a narrow study of the physical aspects of dance. We propose that dance types are characterized by a small set of parameters whose settings account for the wide range of movement differences.

LINGUISTIC PARAMETERS

Appendix C offers examples of linguistic parameters. While no area of theoretical linguistics is without controversy, parameters are a primary way of making comparative generalizations across the components of the grammar (Appendix A). While a parametric typology distinguishes between grammars rather than particular utterances, the parameters are responsible for aspects of the organization of the sounds and words in utterances. Thus parameter settings are realized in utterances. This is important to bear in mind as we approach the analysis of dance—where parameters belong, arguably, to dance technique but are realized in dance movements.
EXISTENCE OF DANCE PARAMETERS

Seeking dance parameters is a new endeavor in dance typology (see Appendix D for approaches in other disciplines). Establishing a parameter-based approach to dance typology requires the same level of scholarship that linguists devote to the task of analyzing language. It would take years of scholars studying dancers and nondancers learning many types of dance, interviews with teachers and audience perception studies. This article does not do that; rather, it is a thought piece intended to initiate discussion. Still, we do present three arguments for the existence of dance parameters.

First, choices in dance lead to movements coherent with those choices and therefore characterize dance traditions. When we make these choices, we set the parameters of the dance traditions. Consider the fact that it is difficult to override existing movement memories [3]. In a modern dance technique class (MDTC), it is easy to tell who has had prior ballet training—an observation that spurred our study. Those with ballet training will often have trouble allowing movement to follow weight shift rather than vice versa. They will maintain alignment of body parts in the face of their teacher’s demonstrations that break such alignments. Their movement quality will be balletic. Their inclination will be to turn their feet out. In sum, they carry ballet parameter settings into MDTCs—they have a dance “accent.” The dance student’s work here is similar to a second-language learner’s, where influence from the parameter setting of a first language causes errors in a second (Appendix A).

Next, consider the task of circumscribing dance traditions. Some scholars object to making distinctions between dance forms at all. Take, for example, Twyla Tharp’s opinion on modern and ballet: “The division was very artificial. It was a war zone that we didn’t need. I think that movement is movement” [4]. Further, many dance types are in flux; contemporary proponents present new directions. Here, we work with gross classifications to demonstrate the potential of our approach. But even while the lines between dance forms are not clean, (these very) dancers and choreographers recognize different forms as they talk about “crossover” dances and dancers, as witnessed by Tharp’s dances “Deuce Coupe” and “Push Comes to Shove.”

Our third type of evidence for dance parameters is a “negative” one: When you learn a dance, some movements are easily adjusted for. We asked a class of linguistics students from seven countries to pinch their earlobes as they learned a new dance. No one had trouble. Further, they didn’t find themselves pinching their earlobes when they were asked to learn another dance where we made no mention of hand-ear contact. The ease of learning and the absence of interference from or into other dances indicate that no previous dance experience had set a parameter for hand-ear contact (which does not preclude the existence of such a parameter—it indicates only that these students had not set the putative parameter). This contrasts with the work involved in learning to point toes in ballet and the interference of ballet point when learning other dance types.

LIKELY DANCE PARAMETERS

Scholars discuss many physical factors relevant to dance traditions, working from observations of dances (Appendix E). In contrast, we start not from a set of dances, seeking parameters within, but from the physical realities of a body at rest and in motion, realities that are unavoidable regardless of dance tradition.

We begin with these physical facts:

- The human body is symmetrical, left to right.
- It has a most prominent facing.
- When standing at rest, paired joints are aligned vertically and horizontally.
- Gravity affects a dancer.
- Motion goes through space and time.
- In a natural resting posture, the head is highest.
- Motion initiates somewhere.
- Motion is composed of parts, thus sequencing arises.
- Motion has quality in terms of flow.
- Motion varies with muscle tension.

These observations allow us to propose the potential parameters below, where we often mention how a MDTC might teach the settings. This is not because MDTCs are a standard but because we, personally, can draw from our experiences with them.

Our discussion is sometimes of participatory dance, sometimes of performance dance, although the latter witnesses almost constant introductions of new techniques. For example, David Parson’s dance “Caught” subverts expectations about gravity—the lights strobe, and, when they are on, the dancer is mid-leap. Here, however, we discuss unavoidable physical realities. Talking about dance seen only under a strobe is fascinating but adds little to the understanding developed here.

Prominence

Human bodies are symmetrical across the sagittal plane; maintenance of balance across that plane in ordinary activity helps avoid pain and deformity. MDTC teachers show consideration of this balance by having students do a movement figure “on the right” and then “on the left.” Evidence that students learn this balance comes from the fact that while injuries are frequent, common causes are intensity and frequency of movement [5], not fatigue on one side. Studies of injuries rarely mention which limb gets injured, presumably because the side on which an injury occurs is not significant [6].

Individual dances, and even dance traditions, on the other hand, can be imbalanced with respect to sides. Studies of injuries in elite preprofessional ballet dancers do record a side difference (in contrast to general studies of dance injuries), where the right foot and ankle are typical injury locales [7]. Perhaps ballet is right-side prominent (Fig. 1). We therefore suggest a Side Parameter.

Second, locomotion involves a path with direction. The human body can move upright in any direction. Forward and backward movements are primary, and in these movements inter-limb (arm/leg) coordination aids, but it does not in sideways locomotion. Forward is more primary than
backward, probably because of facing (discussed below) and how the central networks function in the control of locomotion [8]. However, dancers do not usually move forward exclusively in a dance, and if they do, we do not expect them to maintain a straight path and/or to turn their backs to the audience. We therefore propose a second prominence parameter: the Direction Parameter. Again, it is common in MDTCs to do an exercise first “to the front” then “to the back,” and often “to the side” as well; so teachers explicitly teach the various settings of the Direction Parameter.

This naturally leads to another prominence parameter: the Facing Parameter. The motor orientation of our bodies—forward—correlates with our sensory reception being largely on the body’s front facing. Additionally, nonlinguistic expressions of emotion occur mainly through the manipulation of facial features, postures and respiration (panting, heaving) [9], which are easily detected from the front, less so from the side and least from the rear.

Evidence for prominence parameters comes from noticing student errors—another observation that spurred our study. Generally, students find one side easier—typically the right (dominant for most). If a dance sequence is long, complex and fast, we often find the following situation: A student will perform the sequence properly on the right. Then the student will attempt the left. She might perform a few phrases properly, mess up the next by performing it on the right and from that point on the rest will be performed on the right; the student will switch parameters from left to right, midway.

Prominence matters in dance traditions. In weapon dances, the hand holding a sword can be predetermined—e.g. the right hand in English Morris dancing (Fig. 2). The fact that one hand holds weight with a visual extension into space while the other doesn’t affects the (quality of) various arm movements. Likewise, many dance traditions maintain continual awareness of facing front, with the dancer largely facing the audience or in partial profile (as in ballet), whereas others have a 360-degree orientation (as in folk and western performance dances). There are even performance dances in which the back can be prominent (such as Trisha Brown’s “If you couldn’t see me,” a deliberate departure), subverting our expectation of front facing conveying the most information.

Alignment

In MDTCs, the cautionary reminders to “keep your shoulders over your hips” or, when in a lunge, to “keep your knee over your ankle” are calls for body-part alignments. If each of the pairs of shoulders, hips, knees and ankles are aligned horizontally and vertically, we have no locomotion with respect to the lower limbs. Unless we move exclusively on our hands, we must throw off this alignment to achieve locomotion.

Alignment has physiological effects, which might offer motivations for the parameter. Proper alignment avoids health problems; misalignment exacerbates them.

All dance traditions break some alignments, but in at least one, the shoulders and hips maintain vertical and horizontal alignment: Irish step dance (Fig. 3). Thus there is a Vertical/Horizontal (V/H) Alignment Parameter.

A second alignment parameter involves orientation, which follows from the fact that some joints both flex and rotate. Men tend to have natural foot rotation inward [10], while women have it outward [11]. This tendency might motivate the Orientation Parameter. In MDTCs and ballet classes, one contrasts “turnout” to “parallel.” The student is taught to point toes in the direction in which knees point, to protect the health of the joints. Early ballet set this parameter to turn out as the default position (Fig. 4).

Throwing off the alignment of any joint pair leads to weight shift and possibilities for locomotion. Dancers can vary dynamics so that their movement follows weight dis-
Gravity

In MDTCs, teachers help students master reactions to gravity, including submission (dropping), resistance (lifting limbs) and defiance (jumping), in preparation for the ways dance traditions treat body weight; that is, preparing them to respond properly to the particular dance tradition’s setting of the Gravity Parameter. Some dance forms re-embrace gravity, working with deeply folded joints and an earth-hugging weightedness. Some do the opposite, aiming for flight. Often, changes in weight position affect other parameters; the ballerina doing a pirotette arabesque must increase abdominal tenseness (a parameter below) to maintain vertical alignment [12].

Aerial dance allows innovations in vertical movement and changes the effects of weight shift. Ballet creates the illusion of freedom from gravity. In a leap, as a dancer’s legs rise, the center of gravity rises, affecting the path of the dancer’s head. What would have been a simple arc becomes a curve upward, then a straight line, then a curve downward—the dancer seems to sail. Partnering in lifts further allows the appearance of weightlessness. Providing support as a dancer turns extends the number of turns possible, defying laws of momentum and inertia [13].

Inversion

The human body favors the upright position, as evidenced by the weight and shape of our bones and joints, as well as by the range of motion of our legs compared to our arms. This very naturalness makes inversion noticeable, and noticeable variations—particularly those requiring skill, strength or flexibility—are a fecund source of parameters, hence we propose an Inversion Parameter. Unsurprisingly, in MDTCs we often invert (e.g. cartwheels, moon rolls, etc.).

Some dance traditions are built on inversions. Capoeira and break dance place weight on the arms, head and upper back, freeing the legs to kick, twist and flutter (Fig. 5). Aerial dance removes weight and balance constraints on inversion, allowing even a finger to be the lowest part of the body. Contemporary dancers have playfully transferred dance phrases created with arms to legs and vice versa, or they have taken the arms from one choreographed dance and joined them to the legs from another (consider the works of Sara Rudner or Trisha Brown, as in Brown’s “Present Tense”).

Space

Dance can involve movement in the area immediately surrounding the body as far as one reaches with legs and arms—the kinesphere—as well as movement across the floor and in the air and aquatic space. Thus we propose a Space Parameter. Western dance traditions stretch to the edges of one’s kinesphere [14]. There may be leaps and jumps, with arms and legs thrust to fully straightened length. In contrast, Eastern dance traditions tend to cover less space, and joints are more often softly bent [15]. Each dancer rests within his kinesphere.
Sequencing

Movement can be analyzed in parts; therefore dancers must learn to sequence linearly and produce movements simultaneously. MDTCs often practice isolating movement, perhaps to help dancers understand Sequencing Parameters. A dancer might make a circle with the top of her head, whole head, shoulders, ribcage, pelvis, knees or ankles. Often, teachers will have students do “the leg part” without the arms, then “the arm part” without the legs, before “putting it all together.”

Sometimes linear sequencing is not a choice for physiological reasons; a plié must precede and follow a jump, for example. Other times, sequences of movement may be constrained by momentum and flow—physics in a casing of esthetics [16].

Choreographers might choose to initiate two actions simultaneously or to begin one action before the last one is completed. Simultaneous actions can have different speeds, directions and energy qualities, making danced action less predictable.

Rhythm

Dance moves through time, so a Rhythm Parameter is evident, where the absence of rhythm is a possible setting. Teachers in many traditions count aloud (or clap, etc.) as students dance. If there is a musician accompanist, the teacher may request a certain timing. That we recognize timing distinctions in musical (or other) accompaniments independently of other auditory input [17] supports the idea that rhythm is an independent parameter.

In MDTCs, teachers might repeat exercises with different timing. Even when teachers have students walk “naturally,” or tell them to do a sequence with whatever timing “works” for them, the accompanist might still be playing at her own choice of tempo. Teachers use music to guide the rhythm of dancers’ movement, which is no surprise, given that dance and music go hand in hand in many dance traditions.

Rhythm is so deeply ingrained in dance that when untrained people dance they adjust their movements to match a rhythm change in the musical accompaniment, especially with bass drums [18]. Likewise, small children are inculcated with their culture’s dance traditions at events that usually feature music. When we see a two-year-old responding to a musical beat, sometimes the child’s movements are typical of their developmental stage, but other times the movements are particular to their culture’s dance traditions.

Initiator

Movement always starts somewhere; hence we propose an Initiator Parameter. However, we must differentiate between which part of the body seems to be pulling or pushing the other parts along versus where an actual movement starts.

In MDTCs, teachers might ask students to “initiate movement” with a given body part in the former sense. With this notion of initiator, any visually apparent body part could serve. These initiators are “external,” since the movement could initiate with the head—perception-wise (but also production-wise)—but it then carries the whole body through space.

We can also consider “internal,” or intrabody, initiators of movement. Where within the body does movement start and where does it go? MDTC teachers talk about letting the movement start from “the core” and radiate (or ripple, or move in jagged ways) to the extremities or vice versa.

Quality of Movement

Movement has something almost textural about it, which is difficult to describe but that we call here “quality,” and that leads us to propose a Quality of Movement Parameter. You can prance or march. A hand can jab the air or glide through it. The quality of movement characterizes dance traditions. In Cambodian Khmer dance, for example (Fig. 6), some dancers are assigned roles based on their body type and facial structure. Within each role there is a specific gestural language, recognizable by the movement’s strength or smoothness or jaggedness, and a further distinction in its manner, with gradations from most to least refined [19]. In Phnom Penh, Soeur Thavarak demonstrated classical Cambodian versions of actions as done by “refined,” “ordinary” and “wild” monkeys [20]. Each has its version of a scratch, a walk on four limbs or three limbs, etc. Differences in movement quality concern placement, size and tone: The wildest monkey has looser, more “flung” movement. The most refined monkey is slower, with smaller actions and less (seemingly involuntary) repetition.
Sophiline Cheam Shapiro, director of the Khmer Arts Ensemble in Phnom Penh and a former court dancer, trains dancers to become “stars” [21]. Shapiro implies that what imbues dancers with their unique, ineffable quality is a spiritual connection to deceased teachers and former dancers who literally possess the dancer. What are the differences one senses that make one dancer’s qualities sublime compared to another dancer who is competent but lacks that certain something? It lies in the subtleties of their movement manner.

**Tenseness**

Muscles are involved in voluntary movement. In MDTCs, teachers often have students lie on the floor with their arms and legs extended in an X. The students then roll to one side, curl into the fetal position and extend fully before taking the fetal position again and then returning to the X. This is typical of exercises meant to teach dancers to contract, relax and extend their muscles—to master the settings of the Tenseness Parameter.

Many types of dance can be partially characterized by extreme contractions in the torso or in toe pointing or, alternatively, by the lack of these.

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**AN APPROACH TO DANCE TYPOLOGY**

We have suggested several possible parameters:

- Three prominence parameters of Side, Direction and Facing
- Two alignment parameters of Vertical/Horizontal and Orientation
- Gravity
- Inversion
- Space
- Sequencing
- Rhythm
- Initiator
- Quality of Movement
- Tenseness

While the motivation for these parameters was physical, not cultural, many are common to cultural approaches (Appendix E). This considerable overlap encourages us in thinking that parameters might usefully typologize dance purely by articulatory factors.

In Table 1 we explore these parameters by comparing six dance forms: Cambodian, Modern/Contemporary (M/C), West African, Ballet, Release and Hip-Hop. These were selected to offer some distribution across the world and across traditional and newer western forms.

Evaluating the usefulness of this approach of distinguishing between dance traditions requires us both to take a closer look at the details and to step back for an overview.

Let’s consider just one detail: use of the torso. This is largely the interaction of several parameters: V/H Alignment, Initiator, Quality, Rhythm, Sequencing and Tenseness. In Cambodian, the shoulders and hips align, while the torso front and elbows can both lead and move in different directions. In Ballet, the spine is fully extended and used in a refined way, with backward arches and head bowing. In the other four dance types, the spine is fluid, with motion initiating from within it. In M/C, we find contractions in the pelvis and other areas and freedom of alignment. In West African, we find rhythmic undulations, with isolations of subparts and an active pelvis. In Release and Hip-Hop, there are refined articulations of the spine within small sections, with Hip-Hop showing percussive rhythm.

When taking a step back for overview, we see that Cambodian is the outlier in the table, although it has similarities with Ballet. M/C shares characteristics with all but Cambodian. Ballet differs dramatically from all the others, with the strong exception of M/C. West African is similar to M/C but also shares characteristics with Release and Hip-Hop.

Additional work is needed to refine these and add new parameters. As they presently stand, the parameters raise sticky issues regarding discreteness. V/H Alignment affects the ways in which a dancer can respond to gravity, and gravity (and physiology) affects the alignments a dancer can achieve. The use of space is affected by sequencing, which in turn affects the extent to which gravity becomes relevant, and so on. Further exploration should winnow away unenlightening distinctions.
TABLE 1.  Sampling of Basic Dance Components as They Relate to Specific Dance Forms.

|                      | Cambodian                                                                 | Modern/ Contemporary                                   | West African                                           |
|----------------------|---------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
| **Alignment**        | Shoulders and hips aligned (highly arched back, hyperextended lumbar spine, shoulders and elbows pulled back) | Often out of vertical and horizontal alignment          | Often out of vertical alignment                        |
|                      |                                                                           | Feet variable                                          | Feet parallel                                          |
|                      |                                                                           |                                                        |                                                        |
| **Gravity**          | Upright posture, planted solidly on the ground                            | Often upright posture, grounded in floor work and sense of dropping weight | Yielding to gravity in pulsing downward actions        |
|                      | Controlled (not dropped) weight                                           |                                                        |                                                        |
|                      |                                                                           | Light in lengthening and jumps                         |                                                        |
|                      |                                                                           |                                                        |                                                        |
| **Inversion**        | Not used                                                                  | Used                                                   | Not used                                               |
|                      |                                                                           |                                                        |                                                        |
| **Space**            | Limited locomotion—primarily walking, symmetrical arrangement, mostly standing, few jumps or low-to-the ground actions | Action on the ground and in the air                     | Groups moving in circles and lines                     |
|                      |                                                                           | Spatial patterns of any kind can be used               | High jumps, deep folds of joints to move toward the ground |
|                      |                                                                           | Organized patterns, asymmetrical arrangements, seemingly chaotic or random directions and placements, using whole space |                                                        |
| **Sequencing**       | Lots of overlap and simultaneity                                         | Frequent use of isolations                             | Isolations, particularly of pelvis                     |
|                      |                                                                           | Lots of overlap and simultaneity                       | Lots of simultaneity                                  |
| **Rhythm**           | Well defined                                                              | Variable                                               | Undulations and beats in every direction               |
|                      |                                                                           |                                                        | Highly rhythmic, isolations                            |
| **Initiator**        | Feet, torso, hands, head                                                  | Any part of the body                                   | Pelvis, ribcage, head, feet                            |
|                      | Intrabody: actions flow from the center to periphery and reverse, subtly  | Intrabody: legs and arms move clearly and directly into distinct shapes or can flow more fluidly or jaggedly from one placement to another | Intrabody: responsive fluidity of body parts, one to another, makes strong percussive movements echo through the whole body |
| **Quality of Movement** | Constrained, regal                                                    | Highly variable                                       | Pulsing, percussive                                    |
| **Tenseness**        | Feet: on floor with toes raised                                          | Feet: all settings                                     | Feet: whole foot relaxed, used as a rhythm instrument  |
|                      | Ballet                                                   | Release                                                   | Hip-Hop                                                   |
|----------------------|----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| **Alignment**         | Highly constrained, hips and shoulders often in full     | Often out of vertical and horizontal alignment            | Often out of vertical and horizontal alignment            |
|                      | alignment (with backward arches or with bowing of head)  | Feet parallel                                             | Feet parallel                                             |
|                      | Feet turned out                                          |                                                           |                                                           |
| **Gravity**           | Upright posture                                          | Fully yielding to gravity and using momentum from letting | Using fine-tuned alignments for challenging balances and   |
|                      | Illusion of weightlessness in jumps and pointe work,     | weight down to find upswings                               | inversions                                                |
|                      | lifts and partnering, extending illusion of being free   |                                                           |                                                           |
|                      | of gravity                                               |                                                           |                                                           |
| **Inversion**         | Not used                                                 | Used                                                      | Used freely, including actions balanced on head          |
|                      |                                                          |                                                           |                                                           |
| **Space**             | Traveling                                                | Full use of the floor, including supine, prone and        | Often danced in one spot in solos or in formation in set  |
|                      | Highly patterned, large movements, symmetrical           | outstretched                                             | choreographies                                           |
|                      | arrangement, airborne and with lifts                     | Use of mid-levels—on all fours, standing and jumping     |                                                           |
|                      | Torso rarely close to the ground                         | actions                                                   |                                                           |
|                      |                                                          |                                                           |                                                           |
| **Sequencing**        | Isolations limited mostly to extremities                | Frequent use of isolations; particularly refined          | Refined isolations in every part of the spine             |
|                      | Transitions rather than overlaps                          | movements of the spine in small segments                  |                                                           |
|                      |                                                          | Lots of overlap and simultaneity                          |Lots of overlap and simultaneity                          |
| **Rhythm**            | Well defined                                            | Variable                                                  | Highly rhythmic                                           |
|                      |                                                          |                                                           |                                                           |
| **Initiator**         | Feet, hands, head                                        | Any part of the body                                      | Any part of the body                                      |
|                      | Intrabody: legs and arms move clearly and directly into  | Intrabody: a focus on interconnected-                      | Intrabody: movement travels through the body in fluid or  |
|                      | distinct shapes, with subtle fluidity                    | edness of body parts, dancer feels flow of movement from  | jagged increments                                         |
|                      |                                                          | one area to another in shorter and longer time frames     |                                                           |
| **Quality of Movement**| Graceful                                                | Fluid                                                     | Fluid as well as percussive                               |
|                      |                                                          |                                                           |                                                           |
| **Tenseness**         | Feet: pointed                                           | Feet: whole foot relaxed                                  | Feet: whole foot relaxed                                  |
|                      |                                                          | Fully extended torso, spine lengthened                    |                                                           |
With respect to adding or replacing parameters, the parameters here should not limit the discussion. Our parameters thus far do not mention partnering, for example. All but Release dance makes use of choral action in unison. Cambodian partnering is mostly without contact, while M/C, Release and Hip-Hop make extensive use of contact. In M/C and Release, women support men and vice versa, whereas in Ballet, partnering is mostly handholding or support for lifts and balances. In West African, individual dancers create personal variations and duets show mock battles and courtships. In Hip-Hop, dancers take turns being soloists, often having interactive gymnastic-like routines. Partnering may be a major factor in distinguishing dance traditions. Likewise, our parameters do not give attention to upper limbs or the head. Study of the use of hands could offer contrasts between some traditions and new connections between others.

**CONCLUSION**

Dance parameters of a purely physical nature exist and offer new ways of grouping dance traditions. While we have suggested a handful of parameters, precisely which ones exist and how they interact should be established by further rigorous research. Still, we hope to have shown that one of the more insightful ways of typologizing languages may fruitfully be applied to typologizing dance forms.

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**References and Notes**

1. Marcia Siegel, “The Truth about Apples and Oranges,” The Drama Review 32, No. 4, 24–31 (1988).
2. Ivar Hagendoorn, “Dance, Language and the Brain,” special issue of International Journal of Arts and Technology 3, Nos. 2/3, 221–234 (2010).
3. Julian Dow, “Muscle Memory,” Journal of Experimental Biology 207 (2004), p. 11.
4. Roslyn Sulcas, “Genre Blenders of Modern and Ballet,” The New York Times (5 July 2009), <www.nytimes.com/2009/07/05/arts/dance/05sulc.html>.
5. Jim Macintyre and Elizabeth Joy, “Foot and Ankle Injuries in Dance,” Clinics in Sports Medicine 19, No. 2, 351–368 (2000).
6. See, for example, Nancy I. Kadel, “Foot and Ankle Injuries in Dance,” Physical Medicine and Rehabilitation Clinics of North America 17, No. 4, 813–826 (2006).
7. Jennifer M. Gamboa et al., “Injury Patterns in Elite Preprofessional Ballet Dancers and the Utility of Screening Programs to Identify Risk Characteristics,” The Journal of Orthopaedic and Sports Physical Therapy 38, No. 3, 126–136 (2008).
8. R. Grasso, J. Bianchi and F. Lacquaniti, “Motor Patterns for Human Gait: Backward Versus Forward Locomotion,” Journal of Neuroscience 18, No. 1, 1–15 (1998).
9. Susana Bloch, Pedro Orthous and Guy Santibañez-H, “Effecter Patterns of Basic Emotions: A Psychophysiological Method for Training Actors,” Journal of Social and Biological Structures 30, No. 1, 27 (2002).
10. Yuki Yoshioka et al., “Tibial Anatomy and Functional Axes,” Journal of Orthopaedic Research 7, No. 1, 132–137 (1989).
11. M. Andrews et al., “Lower Limb Alignment and Foot Angle Are Related to Stance Phase Knee Adduction in Normal Subjects: A Critical Analysis of the Reliability of Gait Data,” Journal of Orthopaedic Research 14, No. 2, 239–295 (1996).
12. Donna Krasnow, Steven J. Chatfield and Glenna Blessing, “A Preliminary Investigation of the Relationship of Alignment and Abdominal Activity During Transfer of Weight through Space in Dancers,” Journal of Dance Medicine and Science 6, No. 1, 27 (2002).
13. Kenneth Laws and Cynthia Harvey, Physics, Dance and the Pas de Deux (New York: Schirmer, 1994).
14. Edith Van Dyck et al., “The Impact of the Bass Drum on Human Dance Movement,” Music Perception: An Interdisciplinary Journal 30, No. 4, 349–359 (2013).
15. Toni S. Phim and Ashley Thompson, Dance in Cambodia (Oxford: Oxford Univ. Press, 2000).
16. Toni Shapiro-Phim, “Masked Men of Cambodia,” Magazine of the Philadelphia Folklore Project 19, No. 1/2, 4–7 (2006).
17. Richard B. Ivry and Steven W. Keele, “Timing Functions of the Cerebellum,” Journal of Cognitive Neuroscience 1, No. 2, 136–152 (1989).
18. Daniel Rabinovitch and Kenneth Laws, The Location of Culture (London: Routledge, 1994).
19. Rudolf Steiner, Autobiography: Chapters in the Course of My Life, 1861–1907 (Great Barrington, MA: Anthroposophic Press, 2006/1928).
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