The Relevance of Gravity Orientation to Postural Change and Improved Motor Patterns

An Interview with Kevin Frank

Lina Amy Hack

Kevin Frank

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ABSTRACT *This interview with Rolf Movement® faculty member, Kevin Frank, focuses on gravity orientation and its relevance to structural integration and somatic movement education. Gravity orientation helps us make sense of Dr. Rolf's insistence that gravity is central to how and why humans can evolve. With French Rolfer Hubert Godard's introduction of the tonic function perspective in the early 1990s, practitioners of many somatic arts can appreciate the need to understand how movement patterns, of which posture is an example, can shift. Conscious attention to gravity orientation, when practiced skillfully, leads to plasticity in basic motor patterns not meant to be changed casually. The tonic function model links the basis of physical and psychological stability, further bolstering Rolf's suggestions in regard to this relationship.*

Authors' note: This article has an introduction written by Kevin Frank, a lead into our conversation about gravity orientation.

"Using the gravity response system for movement leads to movement that is more effective, has less effort, is likely to minimize counterproductive contraction of antagonist muscles, and allows for greater subtlety of control."

—Kevin Frank (1995) in "Tonic Function: A Gravity Response Model for Rolfing Structural and Movement Integration," *Rolf Lines*, 16-17.

Historical Points

Ida P. Rolf, PhD (1896-1979) emphasized gravity as the *force* the body is dealing with (1989). Her model of structural integration (SI) posited that posture is plastic because fascia is plastic. Since her time, the world has embraced the efficacy of fascial mobilization. Unfortunately, Rolf's vision of fascia as plastic and a mechanism for postural change remains in question. Brain plasticity, however, has been conveniently validated despite strong initial resistance from the medical world. And we do now have evidence that fascia is a major communication conduit for many things (Hack and Stecco 2022), but especially with regard to body awareness and movement control. Thus, thinking of fascia as the body's internet has become a better way to regard fascia's role and the value of fascial mobilization to bring about postural change.

Then there's Rolf's thing about gravity. Regarding gravity, Rolf's audience and the world didn't seem to know what to do with that one. In 1990, for many people in our community, this situation suddenly changed.

Hubert Godard is a French Rolfer, researcher, and movement specialist, who introduced the *gravity response* idea to the Rolfing® SI community around 1990 (Frank 1995). He spoke about the body's ability to organize in gravity as its *tonic function*[1]. It was most enthusiastically received by his students, who were Rolfers. They were attracted to Godard's many endearing qualities, but especially to his form of movement work and what he introduced as a logical place for *gravity* in the work. Specifically, Godard described that humans have a gravity response system that is part of the inherent infrastructure of the body's movement system and is founded on the *prime directive* of the upright human body – *don't fall down*. The body's movement system rests on this gravitational foundation.

Kevin Frank: [We] do now have evidence that fascia is a major communication conduit for many things. . . . Thus, thinking of fascia as the body's internet has become a better way to regard fascia's role and the value of fascial mobilization to bring about postural change.

Godard's students continue to invite the SI and somatic communities to appreciate the elegance and wholistic nature of this model. Because the tonic function model offers a modern and scientifically validated view of Rolf's work. I've been writing about the consequences of this breakthrough for the past twenty-eight years (Frank 1995, Frank 2007, Frank 2008, Frank 2012, Frank 2014, Frank 2019, McHose and Frank 2006). This approach offers structural integrators and movement teachers a chance to upgrade their understanding of posture, stability, and learning to move better. This has led to many innovations in somatic movement education.

For me, the gravity response model and the logic of tonic function explained the Rolfing SI outcomes I observed more plausibly than the 'tissue as plastic' theory. In the late 1990s and early 2000s, neuroscience research began validating the basis for, among other things, the efficacy of somatic movement education. Coordination and motor

Kevin Frank: Godard described that humans have a gravity response system that is part of the inherent infrastructure of the body's movement system. [Photo by Aziz Acharki on Unsplash.]

KF: They key to success with movement work is to catch the attention of the movement brain, that part of us that choreographs posture and movement. [Photo by Jon Flobrant.]

patterns change because of perception and shifting premovement[2]. The body is a movement system; the basis of movement learning is brain plasticity (Doidge 2007). Premovement is the way the body anticipates an action and sets up the baseline tone and the selection of motor units in the body before any movement begins. Premovement is at the heart of the tonic function approach to motor pattern change.

The gravity response model has held up.

Godard often says, in paraphrase: *The most effective way to teach movement is to teach people to* unlearn *that which prevents the movement*. This implies that the body has inherent intelligence for movement that has been, unfortunately, corrupted. Just like corrupted code in a computer program, our job is to help liberate the body from its corrupted movement programming. This is philosophically congruent with, for example, Buddhist or Daoist philosophy, and another valuable model, Richard Schwartz's 'Internal Family Systems' (Schwartz 2021). The true self is inherently intelligent and responds appropriately when the elements of fear and wanting are, for the moment, quiet.

The tonic function model gives us a grounded examination of the physiology behind this perspective.

One way to ground the tonic function model, quite specifically, is through understanding and embodying the gamma loop model of motor control (Taylor, Durbaba, and Rodgers 1995). When students have the chance to link surprising improvements in coordination with a classic model of motor control, the story clarifies. The gamma loop model explains the way the body moves out of effort and into greater ease. The gamma loop is a signature of this human capacity; it helps build faith in this positive message about the potential for optimal and efficient body health through a perceptive and coordinative approach to a 'Ten Series', for example.

The body develops its gravity orientation at the *nonconscious* (or subcortical) level of functioning, it is automatic and always online. We don't have to teach people to orient to gravity, they are already doing it. What we all can learn to do is pay attention at the conscious level, and the body loves it when we do!

When we bring conscious attention to gravity orientation, we can feel a shift in our felt sense of body activity. It takes us in the direction of openness and curiosity at a conscious and nonconscious level. At a conscious level, the mind quiets, and the body opens to sensation and direct experience, both inner and outer experience. We can feel the nonconscious processes expressing their liberation from learned habits of effort and strain. Anyone can learn to follow their sensations and capacity to orchestrate movement as it is freed up.

We do something similar with fascial mobilization, although the explanation for why fascial mobilization works changes from how Rolf explained it. We can reformulate fascial mobilization as a potent tool that informs the conscious and nonconscious brains, simultaneously, helping to liberate inherent movement intelligence. In the world of somatic movement education, of which Rolf Movement is a brand, we evoke this kind of change by helping people learn to pay attention to the sense perception of their experience, including paying attention to the elements of gravity orientation.

The key to success with movement work is to catch the attention of the movement brain, that part of us that choreographs posture and movement. The movement brain is waiting with an appetite for our attention to be so directed.

Working in congruence with the tonic function model accesses the gravity response system. Movement training based on this model offers detailed guidance as to how it is used for gravity orientation. It improves efficacy and flow in movement. It is a process that brings the body and mind into a more harmonious relationship such that presence and stability become a natural daily practice.

The Conversation

Lina Amy Hack: In this issue of *Structure, Function, Integration,* our primary theme is Space, Ground, and Gravity, and I've been looking forward to talking with you on this topic. Over the years, you have written quite a bit about gravity orientation and the tonic function model. What is gravity orientation?

Kevin Frank: Gravity orientation allows life on this planet to operate in the forms in which life exists here. We, humans, are a good example of how central gravity orientation is. It's useful for us as Rolf's students to know why it's important for people's well-being, and how to appreciate and feel the role it plays in our existence.

Gravity orientation is the mechanism by which our body's nonconscious (subcortical) brain *locates* the body in this world, not as an idea: That I am presently in Florida and you are in Saskatchewan. Rather, it establishes body location as a felt reality. It establishes a specific sense

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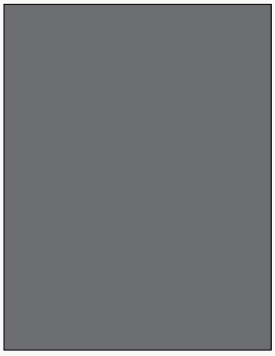

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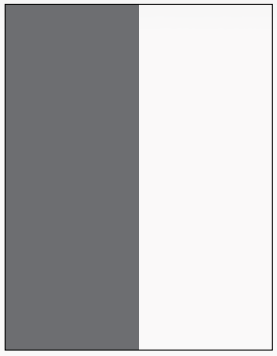

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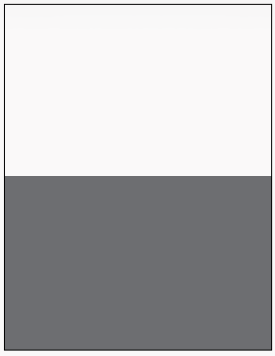

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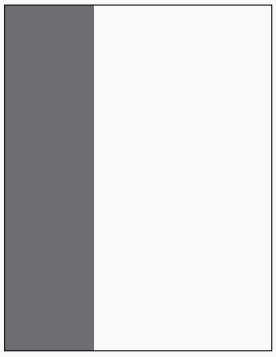

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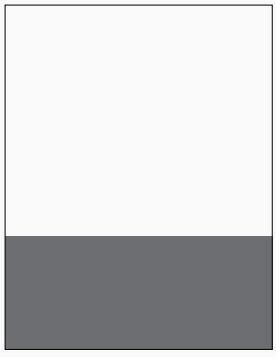

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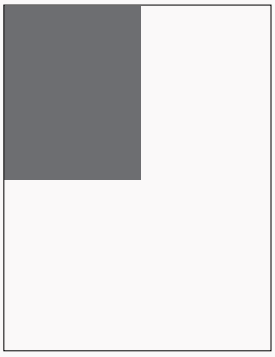

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KF: Gravity orientation works by establishing the sense of *down* via proprioceptors that feel gravity. [Photo by Casey Horner on Unsplash.]

of *here* in this moment. That reality is functioning all the time, automatically, and it helps fulfill the prime directive — "don't fall down."

LAH: That rings true when thinking about young children who are first learning to walk, and their dedication to staying upright. Not falling is important in adulthood, whether people think about that or not.

KF: Gravity orientation works by establishing the sense of *down* via proprioceptors that feel gravity. They tell us about our weight and the direction of that weight. This establishes the 'I am here' information. From the sense of *here*, we are able to build a sense of *there*, and from that, our body-mind[3] builds dimensions of *action space* within which our *movement brain* plots coordinates for locomotion, gestures, and refined movement.

Because gravity orientation goes on automatically, basically all the time, when we bring conscious attention to the 'here and there' experience, or the 'weight and space' experience, the movement brain notices! This allows for an opportunity to have a productive dialogue between our conscious personality and the movement brain, working together in cooperation.

Gravity orientation is a way to understand gravity as fundamental to how our bodies are built and fundamental to how we can lure the processes of our body-mind into shifting patterns that aren't meant to be changed casually. Patterns are there to protect us, to preserve us, to allow us to get food and not become food. All those patterns need to be stable. But now and then, we acquire patterns that are not helpful and we need to know how can we find plasticity in those patterns in a very *selective* way. And when we do, we need to catch the attention of the pattern governance system in our body. We want to 'woo' it so that it says, "Hey, I'm willing to play." Gravity orientation is, in my experience, one of the most reliable keys to getting the attention of the movement brain.

LAH: When I think about the movement brain, I think of it as a collection of many systems, both within the brain and throughout the body, and I know my bias is to think about it in the nervous system and fascia-skeleton loops. But I don't have a firm definition in mind. What do you mean when you say movement brain?

KF: The idea of the movement brain is intentionally ambiguous. Ambiguous because, as body therapists and body-mind therapists, we don't do ourselves a service when we toss out anatomy terms that are sometimes used too simplistically. We are best to keep our models and thinking open. Because science doesn't have it all figured out. The movement brain is *terra incognita* [Latin for "unknown land"] on those old Middle Ages maps.

Partly, the research hasn't poured into motor pattern research the way it has into memory or things related to body pathologies. In the United States, it's not a hot topic. Also, it's not easy to figure out. The movement brain includes our skin, a lot of it is in our fascia, it's in our bones, it's in all parts of our nervous system, but it also has local neural processing in various parts of the body besides the cerebral brain.

There are components of the movement brain that create useful reflexes between motor units and the spine. There's no complete algorithm, at this moment, no one definition that can reduce it down to a linear process, a linear description. It's a series of nested feedback loops that are extremely complicated and many of which we can't get a snapshot of with our measurement and imaging tools. We need to be deeply respectful of the movement brain, this complexity that remains unknown to us, and the reality that it calls

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the shots. The important point, however, is learning to communicate with it!

LAH: This is stimulating to think about and feel in my body as you are talking. Your words remind me of the open-ended possibilities that we play with in Rolf Movement classes.

KF: Yes. And gravity orientation is a way to elicit the movement brain's cooperation, to permit plasticity for movement learning. Say I go to stand up, and it's as if I'm ninety-five years old; I strain, and I struggle, and I can't stand up. Well, that's a motor pattern that's gotten stuck. With a little bit of gravity orientation, suddenly my system realizes – oh – I can access letting go of effort. As I do this, I'm feeling myself find the stability for standing with way less effort. Standing from there becomes a lot easier. Gravity orientation is the nugget in that project of finding ease.

LAH: We have inherited this form where the head, with key sensory apparatuses, is thrust upward, right on top of our structure. And as Rolf described, when we let go, the head and spine know how to go up (1989). Do you marvel at our construction?

KF: It is a bold experiment to be an upright biped. We are the only true bipedal mammal on the planet, the only one that regularly walks on two legs (Thorpe, Holder, and Crompton 2007). We either out-competed or got lucky compared to the adaptations of other versions of *Sapiens* (Harari 2015). And in becoming an upright biped, we created advantages and liabilities. And the planet's wondering how this experiment is going to go with us.

LAH: Indeed.

KF: The upright nature allowed us to create a totally different way of locomoting, gait, and running, which has created all kinds of interesting outcomes. Our species gave the movement brain, the evolving movement brain, a whole lot of new challenges. We became, as Serge Gracovetsky, PhD, calls it, a creature that is *inherently unstable* (1988). Our advantage is, when you want to move quickly as an unstable creature, you just let go into gravity.

As we already talked about, being upright bipeds, we have the urgent prime directive not to fall down. This is another way of saying that when you let go to move, do it in a way that prevents harm to the body from hitting the ground hard. It's a unique problem for the gravity response system.

The Gravity Response System

LAH: Could you say more about the gravity response system? How does this fit in with gravity orientation? This may seem like a splitting hairs question. Still, my understanding is that gravity orientation is a primarily *sensory* capacity while the gravity response system is the *action* part of ourselves relating to the planet with gravity.

KF: Let's start with how our gravity response system is automatic. Also, gravity orientation is a key part of that system. It has to be. It keeps us upright without our needing to think about it. What somatic movement education does is take advantage of the gravity response system to make changes in motor patterns. We bring *conscious attention to the orientation part* of that gravity response system – conscious attention to weight in the form of yielding, allowing weight to be felt, being receptive to sensation, conscious attention to the 'there' part, spatial context, and to an inclusive attention to weight and space together.

These are learned skills to acquire. Conscious attention to these 'where' aspects of the movement brain is taking something automatic and enrolling the system into allowing change to happen. In this way, we change patterns of movement. It's one of our most persuasive tools.

We learn that the gravity response system is our protector and our most effective mechanism of movement control, not only for the directive of not falling down but also for everything-else-movement in general.

Tonic Function Model

LAH: How do you summarize what tonic function is for clients? How do you keep it simple yet meaningful?

KF: Here are my classic responses to new clients, starting with talking about how this is participatory work. They will need to bring their attention to the session for our work together to have a meaningful effect. Then I describe the main reason they have issues is that their bodies are functioning as though they are cars with the brake pedal and the gas pedal welded together. We call this conflicted motor control, right? And a tonic function approach begins a movement conversation about how to uncouple the gas pedal from the brake, to empower the client to access the difference between the two. For me, tonic function describes why structural integration works, so I keep advocating for that view.

Personality within Movement

LAH: My experience lines up with that as well. Learning to consciously access my postural decisions from that deep place of gravity response, as you just so eloquently described, not only changed my structure, it allowed my personality to become more fully expressed. And you write about that (Frank 1995), that there is a psychological change that is possible for the client when there is tissue and movement change. Before I became a Rolfer, I became aware of how I was potentially hurting myself with the holdings that I had acquired. Rolfing SI and Rolf Movement Integration helped me let them go.

KF: Yes, people do experience this kind of harm from motor patterns that we've acquired ad hoc; those don't serve in the long run. Another piece on the psychology note that you just brought up is about stability; when we talk about *not falling down* and stability, falling down is both a physical and psychological falling down that threatens us.

LAH: I think that is right.

KF: We need to get good at both kinds of stability, to find stability in a way that isn't expensive. Expensive physical stability has excessive and uncomfortable holding patterns, while expensive psychological stability is getting caught in neurosis, a distorted perception of reality.

We climb out of neurosis by having stability patterns that we can feel are there for us, whether it is support from a therapist, safe people in our lives, or rewarding and meaningful lifestyle changes, for example. Stability patterns give us psychological security and physical security. The nonconscious part of the movement brain is on the side of psychological stability, not just physical stability.

LAH: Sure, we communicate so much with our gestures and postural shapes, so you are making a solid case for our personality having movements; our sense of self is also embedded in the movement brain. And that the movement brain is invested in our structure expressing

Lina Amy Hack: When we see the silhouette of someone we know well at a distance, we know it is them, by their shape and how their shape moves. [Photo by Adrian Hernandez on Unsplash.]

psychological stability. Like when we see the silhouette of someone we know well at a distance, we know it is them, by their shape and how their shape moves.

Hubert Godard

LAH: What was it like for you when you first heard Hubert Godard present the tonic function model? Did it immediately strike you as a model communicating the essential elements of Rolf's ideas about gravity?

KF: A colleague told me I needed to go to a workshop with him. I was resistant at first. However, it turned out I was quite primed for what I learned from Hubert by virtue of some deep questions I had about the traditional explanations for what Rolf taught. I was skeptical of the idea that fascia is plastic and the corollary that manipulating fascia changes posture mechanically. A mechanical model changing the length of 'guy-wire' so to speak, appeared to be too simple, and unlikely to be correct. But something was going on – what was it?

Godard demonstrated many times changes in someone's body shape and body movement that were astonishing. But he did this without working on the fascia, illustrating plasticity in something *other* than the fascia. Then he explained the reasons why this worked in terms of how the body reboots from outdated motor patterns with changes in perception and conscious attention to what the body likes to know about – gravity orientation.

A few years later, neuroscience research showed how brain plasticity can be measured using functional MRI (Doidge 2007). This went a long way toward validating the logic of the tonic function thesis. It wasn't long before German Rolfer Robert Schleip, PhD, brought forth fascial research that points to fascia as a web of information transfer throughout the body. Taken together, neural plasticity and fascial signal connectivity are a core part of what I started calling *the movement brain*.

The movement brain is something I have written about in the article, "Body as a Movement System" (Frank 2008, Frank 2012), proposing that fascia plays the part of an information transfer system that permits us to move efficiently and 'unlearn' ways we move not so efficiently or effectively. Both Rolf's fascial mobilization and Godard's perceptual and coordinative contribution are examples of this.

Further, the tonic function model helps clarify the outcome of structural integration as motor pattern change. Posture is a motor pattern. Perception is a motor pattern. What we refer to as the body's *structure* is, for our purposes, a person's motor patterns, from gross movement patterns all the way down to subtle but surprisingly profound gravity orientation preferences. All motor patterns are salient examples of human behavior. It so happens that Rolf told us that, "*structure is behavior*," on page 31 of her book (1989).

LAH: I always have the dictionary open, and I can't help but bring in the Merriam-Webster dictionary definition of behavior; it is anything that an organism does involving action and response to stimulation (2023). Every tissue line is involved with action; from the bones that are forming and dissolving their calcium deposits, to our breath and blood circulating oxygen and nutrients throughout the body, the human structure is always moving.

KF: Rolf had this insight about fascia and gravity. She focused on fascia being plastic, which was probably a good way to sell the work. And the world bought that one, but Rolf was sophisticated in her understanding of how biological systems work. She was versed in the paradigm shifts of Ludwig von Bertalanffy

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[PhD, Austrian Biologist, (1901-1972)] and Norbert Wiener [PhD, American mathematician and philosopher, (1894-1964)], as two examples.

Von Bertalanffy made an enormous splash and revolutionized the life sciences by proposing something we all now take for granted – that we need to model biological processes as complex systems that function in feedback loops. Wiener went further to formulate the science of cybernetics. Trying to use mechanical physics models (in the Western world at least) to explain how living creatures operate proved inadequate by the 1920s. There is evidence that Rolf was deeply saturated with systems thinking. Thus, Rolf was able to define structure as a system of behavior, way back in the 1970s.

The Unbendable Arm

LAH: So, you were primed for Gordard's movement ideas, that must have been really exciting to hear this new explanation about fascia and gravity, finding ease and efficiency with the tonic function of posture and walking.

KF: When Hubert burst on the scene in 1990 at a conference in Boulder, Colorado, he was delivering syntheses of new ideas and their application. He reads tremendously, and he quickly spots the essence, the relevance in what he reads. He gave us many gifts. He showed us the 'unbendable arm'[4] experiment (that Lael Keen shared with him from her Aikido training). Later, in a laboratory in Milan, he was able to test what happens during the unbendable arm demonstration with electromyography.

When the subject places their arm on another person's shoulder and then is asked to try to prevent their arm being bent at the elbow, the arm can be bent with downward pressure. When the subject simply grounds their feet and reaches toward something in the distance with the outstretched arm and hand, it becomes much more difficult for the operator to bend the subject's arm.

Measuring the muscle tone in both conditions revealed how the muscle activity completely changed from conflicted muscle activity to no conflict. When the person is simply using their might, the triceps were keeping the arm straight, but the biceps were also firing, which inevitably helps the arm to bend when pressed down by the other person. When the subject was grounded and reaching, the electromyography indicated the biceps became quiet and the subject was successful in not letting the arm be bent by the other person.

Godard showed us many demonstrations of shifts from efforting strategies to strategies in which elongation accompanies stability. That's an appropriate hallmark of structural integration: when we meet demand, we satisfy the challenge and we grow longer and larger at the same time.

With those demonstrations, I was convinced. It made sense in a way that I craved, I was eager for such an explanation that embraced the work we all love to do and that makes logical sense. And I see it working well with my clients. It is an updated way of thinking about organizing in gravity.

Human Gravity Response System

LAH: Would you say that the human gravity response system is a singularity? Is it one thing? Or is a meta-system, a confluence of many systems?

KF: I think it's both. A singularity in the sense that if you're in a body on this planet, it's particularly unique to have Mother Earth caress all of us in this marvelous and mysterious way. It's invisible, it's ubiquitous. Our body is built around a response to gravity. If we grew up in a gravity-free environment, I don't know what we'd look like, but it would be different. I know that if you put cells in a gravity-free environment, microtubules develop totally differently [see Fascia Insights on page 6]. So, the gravity response is a singularity in the sense that we each have this relationship with this planet. It appears to me that the infrastructure of our movement brain is totally built around it. Our systems depend on it and are woven into it.

On the other hand, biological systems are, in a word, complex. The body's movement

control system is highly complex, and there's much more for us to learn about it. However, we can safely say that the human gravity response is an essential part of the human perceptual and coordination system because we build our perception and coordination to move about in our world with gravity response baked in. It's a developmental process that continues throughout adulthood.

A Note about Premovement

LAH: So true. When we were talking before this interview, you said something I wanted to revisit. You said that premovement is at the heart of the tonic function model. Of all the tools available to work with tonic function (Frank 2008), what inspires you to focus on that one?

KF: Premovement is a key to accessing motor pattern change; to bring our conscious attention to it, we affect our gravity response. Gravity orientation is foundational, and elements of premovement have the most chance of shifting patterns in the movement itself. Many parts of the premovement approach have embedded elements that are establishing weight and space in various ways. Taking time to feel the sensory impression of the floor or setting up a table against the wall so the skin of the client's feet differentiates and amplifies the experience of 'here' within the foot. Sensing the air on our face helps differentiate and amplify the sense of 'here' within the head. Imagining a distant but enticing object helps establish a sense of 'there'.

KF: Godard showed us many demonstrations of shifts from efforting strategies to strategies in which elongation accompanies stability.

Premovement, again, works as an intervention because the movement brain does it anyway. Our somatic interventions only work because we are speaking to the movement brain in ways that agree with its design. Also, just to state emphatically: trying to change movement mid-stream doesn't work. The train has left the station and it's too late to have much effect. What to do? Stop and start over, take the time to modify the initial conditions.

KF: The body's movement control system is highly complex, and there's much more for us to learn about it. [Photo by Gustavo Torres on Unsplash.]

Premovement is a vast realm of investigation and one that is best explored in a collaborative relationship with a student or client. Ultimately, working with premovement is personal and best arrived at through experimentation; accessing ease requires determining how a participant learns and adapts.

LAH: Yes, I notice my premovements to feel and soften rather than become more rigid throughout the day. Actually, paying conscious attention to my premovements has gotten me through a lot of tough moments, like getting an adult tooth pulled, and having difficult adult conversations. In those cases, I payed attention to the minutia of my feet and toes, I felt my hair and got curious about what was happening within my face. As I did that, my spine softened.

Also, as I learned in Rolf Movement classes, it is helpful when I imagine that distant place on the horizon, like the 'there' that you mentioned, I love that place; it feels like my 'outrigger' if I were a boat. This attention to premovement is a good way to spend time when the going gets tough. It keeps me completely present and in the moment, just like you said. And I do talk about this with my clients, I coach them on how to access these things, and it works for them too. But premovement is only one way in, right?

KF: People have different access points, so we could talk about fields of potentiality. That's a wholistic map, isn't it? As a practitioner, being comfortable with not knowing is very important so we can be truly curious about the places within which a person can make discoveries. We listen for the metaphors people find accessible, whether they're

more touch-oriented, visual-oriented, or auditory-oriented, and we pay attention to the resources they draw from (see page 69 for a related article). Learning what resources a person resonates with is essential. We want to invite people to teach us; share with us the things that are resourcing, to be curious about that from the get-go. And then, we want to remind them what we heard by introducing elements in our offer that include those resourcing opportunities.

We're looking for opportunities, hoping to facilitate happy accidents of discovery. With premovement we pay attention. Say the person we are working with loves to knows, like kneading the dough, to build a new resource in a different context. This allows the person to have further access to the movement brain intelligence, and the ease she or he discovers to do a push into the dough. Sensory receptivity is an example of premovement that relates to gravity orientation. And the fascia has an essential role in "listening" and supplying the system with vital information for intelligent movement.

LAH: Do you think the ease we find when applying the tonic function model, the softening within our system, is similar to the bliss state of enlightenment spoken of by people who meditate?

KF: Learning to receive sensation is like when you're making bread. What would happen if you slowed it down and let that sicky dough feeling touch you? And how would it be to allow yourself to feel the stickiness on your hands? [Photo by Nadya Spetnitskaya on Unsplash.]

make handmade bread. We might help her or him to notice and receive sensation in their hands, we might offer, "Learning to receive sensation is like when you're making bread. What would happen if you slowed it down and let that sicky dough feeling touch you? And how would it be to allow yourself to feel the stickiness on your hands? Now, as you press my hand, can you first receive the contact?"

We're trying to find places where a person is already comfortable and has a sense of success and happiness. We invite her or his awareness to a sensory experience similar to what she or he

KF: Great question. It depends on who's the one speaking about enlightenment, but I think I know why you're asking this question. If one posits that human beings are endowed with the capacity to experience simple activities that evoke joy and gratitude, say as they respond to common challenges, then perhaps we are in the territory of what has been called by Zen folks, "*ordinary mind."* To move with uncanny skill and feeling as though *no one* is doing the movement. There is this potential for the work to guide one into this territory. The tonic function domain is an inquiry. It's an inquiry through which we might, on a good day, find some relief from the struggle in our movement, in our breath, in our presence, at least for some moments at a time.

Your question also asks us to consider: how do contemplative traditions and Rolf's work interweave. And what are we looking for as practitioners? Good matters to investigate.

LAH: Yes, I think about that a lot.

KF: It also leads us to, what would we most wish for those people with whom we work?

LAH: Exactly.

KF: What feels to me to make the most sense is the notion that tonic function is a map for how certain happy accidents can and do occur: a place where there's effective easeful movement, strong movement, including just sitting still – feeling the quiet flow and support of gravity. Also, moving to open a door with smooth efficiency, or lifting a heavy stone and it feels less efforted. Where there's effectiveness, there's stability and a sense that no one is doing it. I like that because it's both a grand vision and a very simple one and a self-referential one. No one can tell us better than we know ourselves that this is a good moment. In such a moment, perhaps one could say, "Here I am, sitting, without the sense of burden in this body. Here in this moment, simply present."

LAH: That is my wish for my clients, yes, you nailed it. I want them to be saying that to themselves, and that it is their experience of most of their moments; they are unburdened.

Gamma Loop Model of Motor Control

LAH: Speaking of challenge, I find it to be a challenge to understand the big picture of the gamma loop model of motor control. How do you like to describe it for your students?

KF: The gamma loop story is a useful way to connect the gravity orientation story, our embrace of its value, to the story of shifting motor patterns. Basically, the gamma loop is neural circuitry that sets the tone of motor units within muscles, and it does this automatically. This is handy because if we had to think about how to stay upright all the time, we would surely fall down! All skillful movement involves highly nuanced

and differentiated orchestration of the gamma system to set the tone of our motor system much better than our attempts to control musculature directly.

When students learn how the gamma system works, they realize that the stretch reflex and the gamma control of the motor-unit tone are linked. The body is built around an automatic system for staying upright, and this "infrastructure" is utilized to perform all learned motor patterns. At first glance, the gamma system feels "roundabout" and inefficient; but slowly, students realize it's quite efficient, and elegant. The gamma system doesn't provoke feelings of effort, so, we experience strength and power but don't get tired!

For me, this was one of the biggest and most persuasive moments in the classes with Godard. The usefulness of the gamma loop is understanding why this work works, and it's part of how we teach new people about the tonic function story. Oftentimes in class, we'll take the time to act it out as a group: one person playing the role of the spinal cord, one person being the type A afferent nerve, one person being the muscle spindle, one person being the cerebellum, one being the gamma motor neuron, another being the alpha motor neuron, and so on. We act it out because it's not an easy thing to grasp, to keep all of the elements of those feedback loops within feedback loops, straight. And when you act it out, you get a visceral sense of nested feedback loop governance – cybernetics.[5]

LAH: It's not linear.

KF: It's not linear, and we're not used to systems thinking unless we're scientists with a systems background, steeped in the work of people like von Bertalanffy and Wiener, who I mentioned. Computer programmers understand systems thinking of course, and might get the point of the gamma loop if they are interested in body movement, which some are. The gamma loop is the system's view of how our gravity orientation, gravity response, and tonic function come together. It's miraculous and beautiful. And when students act out all the parts, they feel, see, and hear it working as a system, as opposed to a picture on the board. It's fun to do this in-person as a group of people.

What you find out is why the unbendable arm works. We're shifting away from an "effort strategy" where one's image is of a goal. In the unbendable arm, the goal is to keep the outstretched arm straight. This 'straight arm' image in our mind will activate the motor cortex directly, which is relatively clumsy and undifferentiated. Switching to the movement brain, it's like we hand the task off to this intelligent governance system.

KF: Where there's effectiveness, there's stability and a sense that no one is doing it. I like that because it's both a grand vision and a very simple one and a self-referential one. No one can tell us better than we know ourselves that this is a good moment. [Image by Yogendra Singh on Pexels.]

The person has their arm out. Instead of thinking, "Don't bend, be strong," (thinking directly about the goal to achieve), the second condition of the unbendable arm the person is active in a form of imagination that talks to the movement brain and is openly curious. The person is receptive to the weight of their feet on the floor and simultaneously feels the hand enticed to the space beyond the fingertips. This shift of awareness functions like a switch – the movement brain takes over. People feel the confidence that their arm won't bend, and the anatomy of the gamma loop helps people understand that it's not just a one-time response. This system operates inside all of us, and it's waiting for us to engage with it.

LAH: Yes, that is a nice explanation, and our job is to teach people to access this for themselves.

KF: And for them to believe in it so that they will practice and gain further access and familiarity. We are teaching people things that they don't usually hear about.

LAH: I have a linear question about this system. The second condition, has the person downregulating their gamma system? Or to ask another way, when the gamma system is 'on', is it putting stiffness into the body? And when we access this gravity response intelligence, our "excess efforting" tissue softens, feels like it melts, and we find ease of movement in gravity. Is this turning 'off' the gamma system, a nuanced version of downregulation?

KF: Interesting. The baseline of our muscle tone, which can include chronic stiffness, is, of necessity, choreographed by the movement brain, of which the gamma loop is a big part. Stiffness may have become automatic. However, for background stiffness to occur, it's also evidence of motor patterns acquired under stressful circumstances. So, we can attribute unhelpful holding patterns to the movement brain under orders from the cortical brain, from our beliefs, and at least in part, the conscious, subconscious, and unconscious functioning of the cortical brain. It's that corrupted code I mentioned earlier.

Say we have a person who feels a need to keep their abdomen hard all the time for whatever reason or goal. These are phasic muscles meant for a brief auxiliary response. It's expensive to hold them

tight; it's a flawed strategy for stability. How unfortunate that this gamma system, as part of their movement brain, has been enrolled in beliefs that the cortical brain maintains. A belief that in order to survive and thrive, a six-pack abdomen is required, begets a baseline of high resting tone. Also, there are accidents and/or trauma. One-time or developmental trauma imprints patterns of no safety, no rest. The movement brain obeys the learned beliefs of our history, whatever the source.

LAH: Yes, exactly. We are supporting people to let go of excess efforts, like allowing the shoulders to rest down on the ribcage. For many of our clients, we are working with some version of this. With the example of the unbendable arm, it demonstrates another quality of letting go, there are times when we want and need to be stable and unbendable.

KF: We want stability that is responsive to the moment, without needing to think about it. That's psychological and physical stability married together. Imagine facing someone or something threatening. For example, facing a person with an authoritarian or confrontational style. How does one stand there? With armor? Or with resources like gravity orientation? To stand, backed up with something deeper than one's thoughts, enables one to feel some measure of liberation from focusing on the threat. The threat can then reduce to a smaller part of one's spatial experience, rather than dominating it. Then we can respond better to the situation.

We are prone to fixate on things that appear threatening, and at other times, things that are enticing. Either way, we do that at a physical level and at a psychological level.

In terms of threat, all of us have had times of anxiety in our lives, times that surprised us to feel so much anxiety. We know what it means to feel that a formally friendly environment suddenly changes to a threatening one, to some degree or another. Defensive body responses don't supply authentic feelings of security. Threat and reactions to it typically occur along with diminished gravity orientation. Our responses are hijacked by the memory of previous alarms, to the detriment of actual security, the security we could access if we can *feel via movement brain intelligence*. The movement brain is nonconscious, and it has vastly more clout than our precious mental constructs. It occupies a priority status biologically with regard to our function. At some level, we instinctively know that. We do well to want to be friends with that part of ourselves. We need the protection that it offers.

Invitation to Gravity Awareness

LAH: What is the best way to invite a person to care about having gravity awareness as part of their way of being in the world?

KF: Typically, as practitioners, we tend to teach in the style that has worked for us. When something I learned works really well for me, it's likely you will see that show up in my work, including how I "sell" what I do. What works for me as an instructor or practitioner is to start with easy and simple experiments that are likely to give a student or client a chance to be successful right away. Nothing succeeds like success. There's a tendency in many people we teach, to doubt their own capacity to learn and succeed in movement. A simple and easy experiment should be one that we are comfortable doing with folks of different backgrounds and learning styles. It is good to have backup plans for the day when our favorite movement experiments don't seem to be working. If we try a second time with someone, we should go for what is even easier than what we did first. This is a reframe of Rolf's adage: *If at first, you don't succeed, get out*. I would say, try something easier and more in keeping with a person's resources.

People are usually willing to accept a new story when they start to feel successful in their own experience. After a bit of introduction to the new experiment, if they start to feel that they, too, have a body that responds to gravity information, they start to build a new story based on that new experience. Enrolling people comes from offering something that feels accessible. As we already talked about, paying attention to the varieties of learning styles is essential. We want our clients to learn about gravity, and we want to continue to be students of how each person experiences his or her body so we have an opportunity to be an ally. Facilitating success is the reward, and the gravity story becomes a big piece of that.

KF: What works for me as an instructor or practitioner is to start with easy and simple experiments that are likely to give a student or client a chance to be successful right away. Nothing succeeds like success.

In Summary

LAH: Any last thoughts about gravity and our expertise as Rolfers?

KF: Rolf gave us the fascia story and the gravity story. The fascia story proliferated in many variations and applications. The osteopathic community embraced fascia earlier than Rolf, but Rolf arguably put fascia on the map. She was a good salesperson! The gravity story has been more elusive.

Godard's contributions make the gravity story a grounded exploration of consciousness. Variations of gravity orientation, and becoming aware of premovement is a story that is starting to find an audience as the fascia story

KF: As we stand on Rolf's shoulders, I offer an invitation to reflect on one particular person on whose shoulders she stood: Mabel Elsworth Todd [1880-1956]. . . . Todd drew the attention of doctors and educators concerned with healthy posture and movement. Todd's work is represented most directly in her book, *The Thinking Body* (1937), which was at the top of the Rolf Institute® [now known as Dr. Ida Rolf Institute®] reading list when I applied in 1986.

did – not just in the structural integration community. And truly, the invitation to feel the power and usefulness of gravity orientation is not new. It's ancient. However, those of us practicing variations of Rolf's legacy will find that gravity orientation never gets old, that as a community we can continue to deepen our skills for practicing it and teaching it, and explaining it. And concise explanations tend to derive from things we do every day as a matter of course.

As we stand on Rolf's shoulders, I offer an invitation to reflect on one particular person on whose shoulders she stood: Mabel Elsworth Todd [1880-1956]. Todd taught physical education at Columbia Teachers College around the time Rolf was at Columbia. Todd drew the attention of doctors and educators concerned with healthy posture and movement. Todd's work is represented most directly in her book, *The Thinking Body* (1937), which was at the top of the Rolf Institute® [now known as Dr. Ida Rolf Institute®] reading list when I applied in 1986. Many somatic teachers stand on her shoulders, not just Rolf. Todd used perception and premovement, or what I call "somatic imagination." She didn't, to my knowledge, describe what she was doing as "gravity orientation." However, she was highly effective at shifting people's motor patterns and posture. Gravity orientation was, in fact, a silent partner in what she taught. In her use of ideokinesis (imagined action), she used premovement – and others, including Godard, further contextualized it.

My internalized version of Ida Rolf knew what she was talking about when she mentioned gravity over and over. She seems to have generously left some of its explanations and applications for later generations to hammer out. I am grateful to be part of that project.

LAH: I like that, I think that is true. Rolf left a lot for us to further her ideas. Thank you for your time, heartfelt presence, and insights about gravity orientation.

KF: You are welcome; it's been a pleasure.

Endnotes

1. Tonic muscles are postural stabilizing motor units. Phasic muscles are recruited for brief bursts of activity and movement. Tonic, in the context of *tonic function* theory, indicates that the model rests on the automatic gravity response system that keeps us upright.

2. *Premovement* refers to the way the movement brain anticipates the movement that is about to occur and selects motor units to be ready for the intended action. Premovement is thus part of the movement brain's automatic system. The body does this all the time on its own. Premovement also refers to how we are able to consciously adjust what the movement brain does to prepare for a movement, using gravity orientation and other forms of perceptive activity. By taking the time to adjust premovement consciously, we "reboot" our movement patterns immediately and then over time, we have the opportunity for these rebooted patterns to become automatic.

3. Linking "body-mind" together indicates the philosophical point of view that the body and mind are one, part of the wholistic structure and function of the human being. This is in opposition to the idea of mind-body dualism, first described that the two are separate by René Descartes, French mathematician and philosopher (1596-1650).

4. *Unbendable arm* is a demonstration used in Aikido training to illustrate using chi. A demonstration subject rests their fully extended arm on the operator's shoulder and is asked to resist downward pressure on the elbow joint. "Don't bend your arm." The operator presses down on the ventral elbow joint and the elbow bends. The subject is then invited to ground their feet on the planet and imagine their outstretched arm extending far in the distance like the hand can be a part of a location in the distance. The operator presses down on the elbow joint. The arm is stronger and doesn't bend.

5. *Cybernetics* is "the science of communication and control theory that is concerned especially with the comparative study of automatic control systems (such as the nervous system and brain and mechanical-electrical

communication systems)" (Merriam-Webster 2023, online).

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