Structure, Function, Integration.

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Rolfing® Structural Integration in Europe

Dive into the world of the European Rolfing® Association e.V. In this issue, we have everything you wanted to know about their Germany-based school, the Dr. Ida Rolf Institute® Europe, and their broad reach. Enjoy some remarkable details about a few of their regional associations – specifically Switzerland, Italy, the Netherlands, Czechia, and the UK.

The Embodiment of Body Image

Structural integration invites people to feel, perceive, and move more coherently within their whole selves, which can be profoundly empowering for people of all body sizes through all of life's changes.

Also in this issue

Tonic Function Model

A review of this important movement perspective by Rolf Movement® faculty member Per Haaland.

Tonic Function Model

The Human Gravity Response System

Per Haaland

By Per Haaland, Basic Rolfing® Instructor, Rolf Movement® Instructor

ABSTRACT *Just like the ease that a person experiences when standing on their 'Line', as Dr. Ida Rolf described, people move with ease when they apply the wisdom of the tonic function model, as retired, French Rolf Movement Instructor Hubert Godard has described. In this article, Dr. Ida Rolf Institute® faculty member, Per Haaland, reviews his own path learning, practicing, and teaching Godard's tonic function model from workshops with Godard himself, as well as a mentorship with Rolf Movement Instructor Kevin Frank.*

The tonic function model is an inquiry into how human beings orient themselves and organize their movement within the earth's gravitational field. It references specific features of our anatomy and physiology that have evolved to enable us to stabilize ourselves and move efficiently and gracefully in a gravity environment. Perhaps the most important feature in this regard is the delineation of muscles into two complementary types, *tonic* and *phasic.* Tonic muscles are stabilizer muscles, performing the ongoing, moment-to-moment stabilization needed to keep the body upright in the gravitational field. Phasic muscles perform voluntary movements. The underlying tonic activity of the stabilizer muscles enables phasic muscles to move, act, and express themselves in the world. I believe structural integration (SI) practitioners can benefit from a deeper understanding of the interplay between tonic and phasic muscles and the underlying orientation and stabilization mechanisms that allow us to navigate gravity successfully. Through this improved understanding, we can effectively help support and optimize the healthy interplay between tonic and phasic muscles, using approaches such as fascial mobilization, perceptual enhancement, and movement education.

Hubert Godard

The concept of tonic function was brought to the structural integration (SI) community by French Rolf Movement instructor, Hubert Godard. Initially a chemist by profession, Godard became a dancer, choreographer, and dance teacher. Following his professional dance career, he entered the field of somatics, trained as a Rolfer, and became an internationally renowned movement instructor. Over the span of his career, Godard has pursued the study of biomechanics, developmental anatomy, neurology, physiology, and cognitive psychology, with a particular emphasis on the link between perception, coordination, and movement. His synthesis of ideas – applied through clinical practice, research, and teaching – has benefitted our community by updating our knowledge base, bringing in ideas previously not considered, and helping to illuminate certain aspects of the psychobiological dimensions of our work. Godard's contributions have clarified our understanding of what it is that we are doing in SI and provided us with specific tools related to perceptual expansion, enhancement of coordination, and the linking of gesture and meaning.

Within his career in chemistry, Godard was very successful in the work of recovering and reconstituting gold from industrial processes. One night, after watching a dance performance in Paris, France, Godard was so inspired by the expressive power of the dancers on stage that he decided to become a dancer. Despite his late start at age twenty-two, Godard became a professional ballet dancer and danced for years with several French ballet companies. He then went on to become a choreographer,

Figure 1: Hubert Godard guides student.

dance teacher, and instructor of dance teachers. Following a serious knee injury, Godard sought help from practitioners of various somatic schools. As he began to deepen his own knowledge in this field, he incorporated the work of Ida Rolf, PhD (1897-1979), Frederick Matthias Alexander (1869-1955), Moshé Feldenkrais (1904-1984), Rudolf Laban (1879-1958), and others. Moving on from his professional dance career in the mid-1980s, Godard became a Rolfer, a somatic movement teacher, and a researcher. His research in a rehabilitation hospital in Italy focused on the effects of surgery on breast cancer patients, particularly certain inhibitory responses that were seen to adversely affect these patients' arm and shoulder movements. Through the scientific rigor of Godard's contributions, he has helped ground movement theory in physics and physiology to the great benefit of the SI community (see Figure 1).

Kevin Frank

Advanced Rolfer and Rolf Movement faculty member Kevin Frank has studied and worked extensively with Godard for many years. As an author and an instructor, Frank has produced an impressive body of work, much of it explaining, clarifying, and further developing Godard's tonic function model (see Figure 2). In Frank's 1995 article, he sets forth the foundational idea of the tonic function model that – as gravity-sensitive creatures – humans have evolved a unique gravity response system. By understanding, working with, and enhancing this stabilization system, SI practitioners can help clients achieve improved posture and coordination.

Frank has also written about a particular psoas intervention where he explicitly describes the mechanisms of stabilization, the delineation between tonic and phasic muscles, and the categorization of muscles into primary, secondary, and tertiary stabilizers (2014). Frank explains how poor posture and dysfunctional movement habits are often indicative of underlying confusion in the body's stabilizing system, sometimes referred to as the *tonic system.* Frank teaches that through very specific movement integration practices that communicate with the body's "movement brain," structural integrators and movement educators can help their clients restore good stabilization and healthy coordination patterns (2014, 53).

Through Frank's extensive writing on Godard's work and through his decades of teaching, he has been a major force in demystifying our work and challenging our beliefs about what it is that we do in structural integration. Frank, like Godard, has updated us about recent scientific discoveries, helping us understand and incorporate this new knowledge into our work as structural integrators.

A New Direction

Like Godard, I have a background in dance and somatics, also as a performer, choreographer, and instructor. Over a ten-year period between 2000 and 2010, I had the opportunity to study with Godard on several occasions during various workshops that he taught. I also benefitted from Godard's artistic expertise in the art of dance, receiving his guidance and critique related to the choreographic work that I was developing and presenting at the time. My studies with Godard helped me bridge the gap between two parallel paths that I have been pursuing over the last four decades, the somatic/healing arts and the performing arts.

My continued interest in Godard's body of work, and the way it informed my

The tonic function model is an inquiry into how human beings orient themselves and organize their movement within the earth's gravitational field.

Figure 2: Rolf Movement Instructor, Kevin Frank.

practice of Rolfing® Structural Integration (SI), led me to want to teach this work. Through Godard's workshops, I had been introduced to Kevin Frank. During my training to become an instructor for the Dr. Ida Rolf Institute®, Frank was, and continues to be, a valuable mentor for me. Over the last twenty years, I have put the ideas of Godard and Frank into practice. From that experience, I believe that an in-depth understanding of Godard's tonic function model can greatly clarify and enhance the practice of structural integration and movement education.

About ten years into my career as a Rolfer I started to feel dissatisfied with some aspects of the work. I was practicing a style of structural integration primarily focused on the use of fascial mobilization techniques. I started to feel that my work – while I genuinely enjoyed it and saw that it greatly benefitted my clients – seemed to be lacking something. My parallel work in dance and theatre had for many years offered a rich avenue for my creativity and expressivity through movement. I was frustrated with my inability to enjoy similar creativity and passion in my practice as a Rolfer®.

I wanted to offer my clients something more. While I felt confident in my ability to help relieve my clients' pain and improve their posture, I wanted to help them find the joy of movement and a deeper sense of embodiment. I wanted to help them expand their expressivity, body confidence, and *potential for action*. I wanted to help them develop meaningful self-care practices to take into their own lives. Fortunately, my studies with Godard and Frank answered my dissatisfaction and provided me with a methodology that enabled me to move my work in a new direction.

This article is to help others benefit from my learnings about tonic function. I will give an overview of my interpretation of Godard's ideas, and I will draw extensively from the writings of Frank, as I explain how I think of and teach this work. The tonic function model, by using creative and expressive movement integration strategies, offers SI practitioners a way to move beyond the sole focus on fascial mobilization.

The primary areas of the tonic function model I will review in this article include:

- The physics of gravity as it relates to the human body.
- The gravity-biology perspective – looking at gravity as a fundamental factor influencing the physiology of creatures who live in a gravitational field
- The *triangle of support* – this is the dynamic interplay between three senses modalities related to sensing gravity: the eyes, the feet, and the inner ear.
- The delineation between tonic and phasic muscles and the confused stabilization patterns that may result when phasic muscles habitually take on the role of stabilization. We will examine psoas function as a case in point and show ways to restore its competent function through a combination of manual touch interventions, attention to sensation, and guided movement.
- *Controlled instability* relates to the mechanism of displacement of the spine, enabling a highly energy-efficient style of movement. Controlled instability allows the human body to *let go* into movement as opposed to initiating movement through muscle effort.
- An investigation into the importance of helping clients attend to sensory awareness and perceptual enhancement. The use of movement prompts and guides visualization/ imagery that can help rehabilitate our clients' stabilization capacity.

When teaching Rolfing SI and Rolf Movement Integration, I stress the importance of the tonic function model and how I believe it can serve as a foundational model for our work in structural integration. Tonic function theory can help us understand our work better by explaining and clarifying the underlying gravity response mechanisms we work with and how we can help optimize these mechanisms. Understanding the body's stabilization and coordination systems helps us understand the effectiveness of our interventions. As we come to a better understanding of what we do when we practice SI and movement education, we clarify and refine the way we use our skills to successfully help our clients attain good posture, graceful and efficient coordination patterns, and greater expressivity.

Gravity and the Human Body

> *Rolfers make a life study of relating bodies and their fields to the Earth and its gravity field and we so organize the body that the gravity field can reinforce the body's energy field (Rolf 1978, 86).*

Frank uses the above quote to open his *Rolf Lines* article "Tonic Function: A Gravity Response Model for Rolfing Structural and Movement Integration" (1995). The quote is a well-known saying by Rolf and it points to the central concept of structural integration. With these words she alludes to how structural integration can change the shape and organization of the body and thereby improve its relationship to gravity by optimizing – through realignment – the

Understanding the body's stabilization and coordination systems helps us understand the effectiveness of our interventions.

What do we mean when we say gravity? We all have a relationship with this force that is holding us onto the planet, yet what is it exactly?

body's structural efficiency and well-being, ensuring that the body is optimally 'lined up' within the gravitational field.

In his later article, "Posture and Perception in the Context of the Tonic Model of Structural Integration," Frank points to how Rolf mainly used standing posture as her chief measure of body integration (2007). One of the main ways of demonstrating the effectiveness of her method was through the 'before and after' still photographs, emphasizing the change in static posture that resulted from having undergone structural integration. While we admire and celebrate Rolf's original vision, we can now see how it also had limitations. Rolf's focus on static structural changes was likely due to her reliance on photography as the best evidentiary technology available to her. Simply being upright in the gravitational field with ideal alignment is no longer our only lens through which to evaluate structural wellness. We can now apply the tonic function model as a new means by which to understand the human gravity response.

Letting Go into Gravity: Relating Fascial Manipulation to Physics and Metaphysics

Frank asks us to be willing to expand on Rolf's vision and suggests that the tonic function model might serve as the foundational model for Rolfing SI (1995). Using updated scientific knowledge, Frank challenged and updated us by demystifying our ideas about what we do in structural integration. While acknowledging the power and effectiveness of *fascial mobilization*, he reminds us that fascial mobilization is *not* the only way to promote structural integration.

While fascial mobilization has historically been considered the main component of SI, there are several other tools available to structural integrators. Frank invites us to expand our strategies. Whereas improved *static posture* was the chief measure of structural integration in the past, with Godard's tonic function model, we now have an approach that enables us to view the body from the perspective of *coordination* in gravity *(*Frank 2007).

Structural integrators and movement educators have been known to say things like "allowing gravity to do the work," "letting gravity lengthen the fascial net," and "letting down to go up" (Frank 1995, 12). What lies underneath this sometimes-mysterious language? What do we mean when we use these poetic metaphors? Are we saying that we are interested in gravity as it relates to *physics*, such as in 'stacking up the blocks' to balance the body efficiently with the minimum amount of effort? Or are we curious about the *metaphysical* dimensions of gravity in ways that have been explored by Emmett Hutchins (1949-2016), student of Rolf and cofounder of the Guild for Structural Integration, and others in practices such as *finding the 'Line'* or *getting on one's Line*.

These various angles of inquiry have great validity and have yielded good results, helping us to create models for explaining and teaching our work, enabling us to better understand the human body's relationship with the mysterious force of gravity.

The Solid Physics of Gravity

Rolf was concerned with the physics of the body, "the kind taught in physics laboratories" (Rolf 1978, 52). She was interested in gravity as a primary organizing force. Our entry point as structural integration practitioners is being curious about the forces involved in static posture or 'stacking up the blocks' of the body in the gravitational field. By adding the tonic function model, practitioners become curious about coordination, or how people move their bodies through space as well as in gravity.

What do we mean when we say gravity? We all have a relationship with this force that is holding us onto the planet, yet what is it exactly? As Rolf said, gravity is in the domain of physics. Gravity is a force that was first described by the English mathematician, physicist, and astronomer Sir Isaac Newton (1642-1727). Newton's law of gravitation states that "any particle of matter has an attractive force with any other particle of matter. The magnitude of that force varies directly with the size of the masses and is affected by the distance between the two masses" (Britannica 2022). By 'particle of matter' we mean, any object that has density, form, and shape. And force refers to an event that has a measurable influence that causes something to move. Gravity is a force that makes things move, but since we are able to be stationary as we stand on this planet, what kind of movement then is involved with gravity?

The Earth is the largest mass that we all interact with our whole lives; therefore, the Earth exerts a gravitational force on our bodies as we live our lives near and on its surface. Like the apple that falls from a tree in autumn because of gravity, our body's mass is always capable of falling - with acceleration - until it strikes the surface of the Earth. This downward force is the gravitational attraction between the Earth and the human body. This force is called our weight (Franklin et al. 2019). When we step on a scale, we are measuring our weight. Our weight can be defined as the force of our mass pressing downward toward the Earth. Technically, what the scale measures is the magnitude of the *gravitational contact force* between our feet and the scale.

A stationary person experiences the force of gravity as well as Newton's third law of motion – *for every action, there is an equal and opposite reaction*. Due to this law, a person will also experience an upward force equal to the gravitational force. This upward force is called the "normal force" (Franklin et al. 2019). Normal force presses upward on the body causing stability – the absence of falling.

Rolf noticed that humans are organizing or disorganizing around this upward normal force. Further, the human body is not of singular density or mass. The

Within our complex gravity response system, sensory information is gathered from the feet, the eyes, and the inner ear to be processed within the brain areas associated with unconscious motor control processing – the brainstem, cerebellum, and the medulla oblongata.

mass of a person's head is very different in constitution from the mass of their arms, chest, pelvis, and legs. All these segments have their own center of gravity and different qualities of mass, each relating to the other while moving through space under the constant influence of gravity and its opposing normal force.

In sum, gravity is a force vector that moves the human body toward the center of the Earth. The ground is holding up the human body with an equal and opposite force vector called the normal force, holding the person stationary. Rolf talked about inviting clients to sense their upright structure as though lifted upward by a *sky-hook* (Rolf 1977). Rolf also proposed that a person standing on their Line would experience a sense of weightlessness in their body (Rolf 1989). What Godard brought to us with his tonic function model is a way to take this wisdom of lift and weight into understanding the coordination of movement.

The Gravity-Biology Approach

The tonic function model asks us to look at the gravity question from a *biological* perspective; that is, to look at gravity as a fundamental factor influencing the physiology of the human organisms. From this underlying premise, the tonic function inquiry concerns itself with questions such as:

- What are the specific body systems and developmental features necessary for humans to survive and thrive in a gravity environment?
- How does our coexisting with and within the gravitational field shape our structure, our development, and our consciousness/behavior?

Alignment with Structural Integration

As a starting point when learning the tonic function model, it is worth examining some of the shared premises and assumptions that are a part of the structural integration domain.

- How do we think about our work?
- In what ways do we feel that we can help our clients?
- What are the goals of structural integration?
- What are some of the things we think we can help our clients achieve?

In the 1995 article, Frank suggests certain outcomes we might expect to achieve through successful structural integration work (13):

- Minimum rigidity of the body.
- Effective and graceful movement patterns.
- Appropriate, balanced strength.
- The subtlety of locomotion.
- The kind of movement in which it is difficult to perceive what muscles are doing the movement.
- Contralateral spinal function in walking.
- Free, full breathing.
- The capacity to adapt to ever-changing physical circumstances and challenges.

How do we achieve these things? What are the means that we use to achieve our therapeutic and educational goals? Frank lists some of the main tools that are being used by structural integration practitioners (1995, 13):

- Structural analysis.
- Structural soft tissue manipulation; fascial mobilization.
- Visualization.
- Breathwork.
- Movement practice.
- Verbal negotiation.
- Rapport.

How can a deeper understanding of the physiology and biomechanics of our gravity response system aid us in our therapeutic interactions with our clients? And how can this understanding help us improve the quality and effectiveness of our therapeutic interventions?

Human Beings Are Gravity-Sensitive Creatures

Let us consider how the individual first emerges into the gravitational field. At birth, we leave a fluid, oceanic environment, where there is a limited sense of verticality, and suddenly enter an environment where we find ourselves constantly in an upward-and-downward orientation with reference to the earth's gravitational field (Frank 1995).

As we develop, how are we able to navigate this field? We are equipped with a gravity response system that *reacts to gravity* and allows us to *orient*, *move*, and *assume postures.*

Gravity Sensing as a Physical Relationship with Mother

The immediate physical relationship with gravity must be negotiated along with the relationship to our mother. Human beings first experience gravity through their mother (or primary caregiver). As we are held, we learn to sense gravity through our

mother's/caregiver's sense of gravity. Thus, gravity response becomes inextricably linked to the physical relationship with the mother – the two are layered together (Frank 1995). The gravity orientation of the caregiver is transmitted to the infant as she or he is held and supported.

Viewed metaphorically, an infant's relationship with his or her mother/caregiver can be viewed as analogous to people's relationship with Mother Earth. This view was brought to me during a recent conversation with Certified Advanced Rolfer and somatic education teacher Pilar Martin, who studied and worked extensively with Hubert Godard for many years. As Martin explained to me, to paraphrase, "Mother Earth, with 'her' gravity field, is seen to represent the only constant, the only stable place from where the adventure outwards can safely take place." Martin describes how we can imagine that, figuratively, "in the love affair between planet Earth and all manifestations (humans and all other life forms), the gravitational pull of Mother Earth provides a felt sense of belonging" (personal communication). Gravity is a constant. This constancy, this felt sense of gravity, provides the necessary sense of security for our development.

Godard talks about how, as newborns, we exist in a state of *synesthesia*. Infants do not yet differentiate clearly between different sense modalities. Sensory impressions stream toward us and slowly we start to orient and organize in relation to our environment. Gravity sensing – a felt sense of weight – is fundamental for beginning to differentiate incoming stimuli and for laying the groundwork toward mastering movement in the gravitational field.

The Triangle of Support

To help us understand the interplay of different sensory modalities that are needed for successfully maintaining uprightness and for navigating the gravitational field, Godard stresses the significance of three body systems, together named the triangle of support: the *eyes,* the *feet,* and the *inner ear* (see Figure 3).

The Eyes: Focal Vision (What) and Peripheral Vision (Where)

Vision gives us information about the location of the horizon, we can see what is up and what is down, and therefore our eyes are a part of our gravity-sensing system. In understanding the role of the eyes in successfully maintaining uprightness and ensuring good coordination, we need to look at the two main modes of visual perception, *focal* vision and *peripheral* vision (Goldstein 2010). These two modes of visual perception work together as needed, sometimes with an emphasis on one or the other, to meet and respond to the various situations and challenges of life.

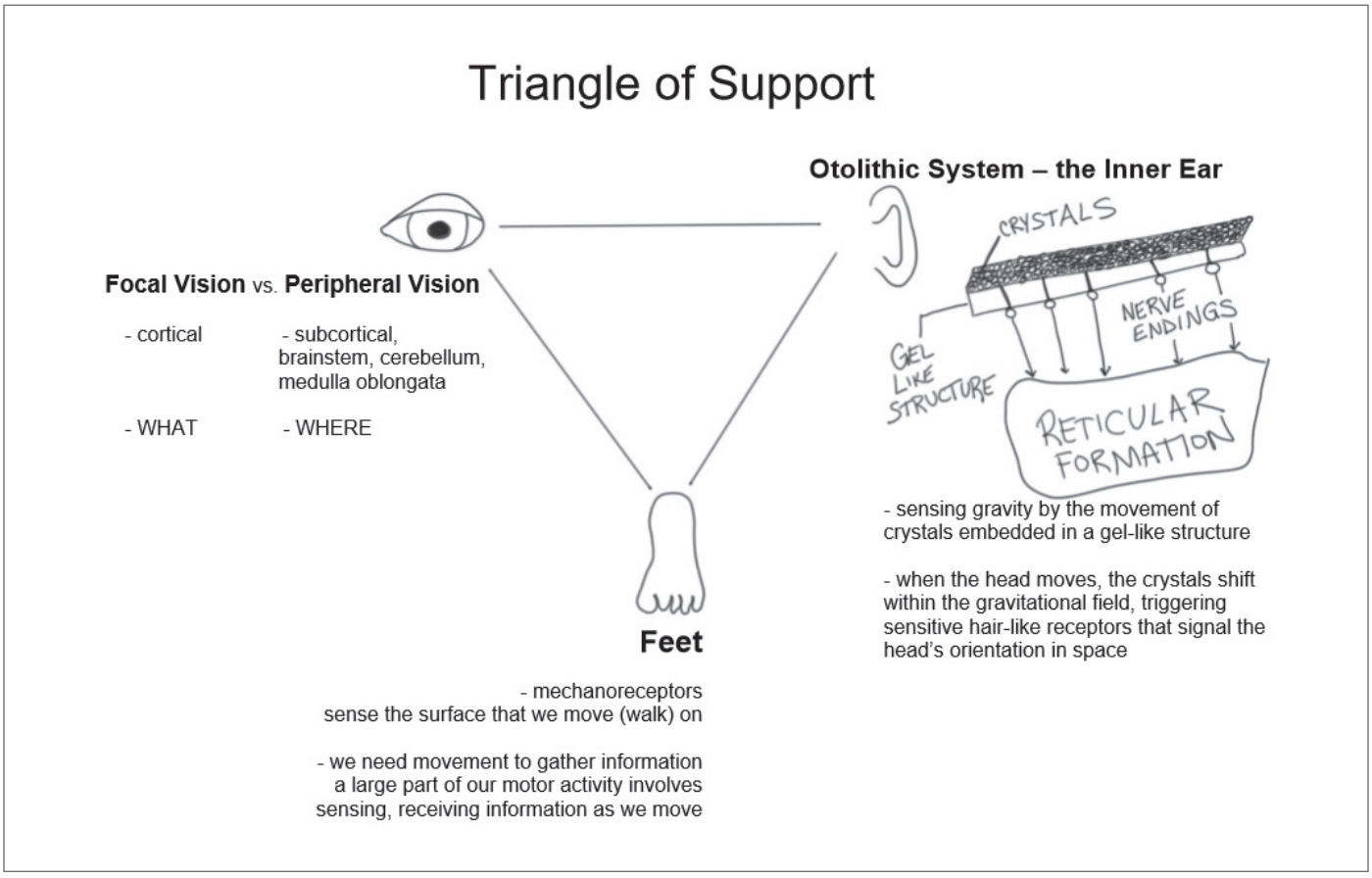

Figure 3: The triangle of support refers to the interplay between three sense modalities that are required for successfully maintaining uprightness and for navigating the gravitational field. The three components of the triangle of support are the eyes, the feet, and the inner ear.

Focal vision is predominantly cortical and:

- Enables a narrow range of focus.
- Features color vision and black and white vision.
- Is used for detail, naming, and differentiation.
- Predominantly involves cones (photoreceptor cells in the retina responsible for color vision).
- Cortical (relating to the 'what' dimension).

Focal vision is dominant during certain specific activities, and many of the activities of modern life tend to emphasize focal vision. While in focal vision mode, we tap into our capacity to *name* and *distinguish objects from each other*, and to *analyze* the qualities of what we are seeing. While engaged in focal vision, such as when we read, drive, or work on a computer, we tap into the what-dimension of our consciousness, very much linked to the cortical part of the brain (Paillard 1991, Clarac, Massion, and Stuart 2009). Due to our emphasis on these types of activities, we find that modern-day humans have become habituated to an over-reliance on using focal vision.

Peripheral vision is predominantly subcortical and:

- Enables broad, 180-degree view.
- Features only black and white vision.
- Diffuse, blurry around the edges.
- Predominantly involves rods (photoreceptor cells responsible for low-light vision).
- Subcortical (relating to the 'where' dimension).

When we engage visually in the *peripheral* mode of seeing, we use and connect more directly to the brainstem, the cerebellum, and the medulla oblongata. These more unconscious sensory processing areas of the brain help resource us in the realm of *orientation*, including *gravity orientation*. We may say that peripheral vision helps us tap into the where-dimension of our consciousness (Paillard 1991, Clarac, Massion, and Stuart 2009).

Good use of peripheral vision was vital for our ancestors living in the wild in order to find food and avoid predators. As we engage our present-day clients through movement integration practices and perceptual expansion practices, we may be able to restore some of the perceptual vitality of our ancestors and help our clients develop the capacity to refine their sense of peripheral vision, to develop their *peripheral attitude*, as Godard told me once.

The Feet

Through the *mechanoreceptors* of our feet, we sense the ground under us, receiving information about sensory phenomena such as the *evenness*, *texture,* and *temperature* of the surface we move across. When we are standing, our feet sense the gravitational contact force of our weight pressing into the ground or the floor. The very act of our feet moving across a surface is itself a component of sensing, inclusive of gravitational force and the normal force. As the feet move, they are constantly gathering information about the immediate environment they are moving across. Eighty to ninety percent of nerve activity in the feet involves movement coordination through sensory nerves that are gathering information from the body's contact with the ground (Godard personal communication, Frank 1995).

The Inner Ear: The Otolithic Organ

The otolithic organ is a component of the vestibular system, which is a complex gravity-sensing mechanism found within the temporal bone. The otolith organs have layers of sensory cells in the inner ear. The first, topmost layer consists of a 'carpet' of stones/crystals. This carpet is draped over a middle layer, which is comprised of a gel-like matrix with numerous hair-like sensors embedded in it. In the bottom layer, the hair-like sensors are connected to sensory nerve endings (Goldstein 2010).

Changes in head position cause displacement of the top layer crystals. As the crystals are moved, this positional change is picked up by the hair-like sensors in the gelatinous middle layer. At the bottom portion of the layer, these sensory signals are converted to nerve signals that travel to the brain's subcortical processing centers, in particular to a region of the brain stem called *the reticular formation.* Through these information channels and feedback systems, we gain valuable information about the position of body parts with respect to the vertical line of gravity, as well as about the direction, speed, and acceleration with which body parts move in relation to the gravity line; this allows the body to orient and respond and balance itself during various activities.

Within our complex gravity response system, sensory information is gathered from the feet, the eyes, and the inner ear to be processed within the brain areas associated with unconscious motor control processing – the brainstem, cerebellum, and the medulla oblongata. As upright creatures in the gravitational field, our motor control system uses this information to continuously negotiate the prevention of falling.

Human Stabilization Through Controlled Instability

Frank highlights how easeful uprightness and efficient coordination is linked to enhanced sensory awareness and heightened perceptual vitality (2014). He points to the work of Serge Gracovetsky, PhD, Canadian engineer and human locomotion researcher. Gracovetsky coined the term 'controlled instability' when he described his finding that the spine and its surrounding structure are fundamentally unstable (1988). The unsupported spine will collapse under a mass of approximately two kilograms, which means it is not the stacking of vertebrae that holds a human being upright. According to Gracovetsky, it appears that the components and segments of the skeletal system are designed to be displaced easily, allowing for easy and smooth shape changes and moment-to-moment adjustments, such as flexion, extension, and rotation of the spine.

Frank links Gracovetsky's controlled instability idea to the tonic function model and explains how this controlled instability offers our species an evolutionary advantage: A body designed for instability can move quickly and efficiently by *letting go* (1995). We can change our position in space quickly and efficiently by letting go of the muscular tonus rather than by initiating movement through muscular effort. This is at the heart of the application of the tonic function model. Efficient movement happens as we harness the forces involved in being upright in gravity and the kinetics of movement: *inertia*, *momentum*, *spring action dynamics*, and *viscoelasticity*.

Controlled instability as an evolutionary improvement has required parallel

improvements in the physiological mechanisms that assure stability while moving in gravity. Perhaps it can be said that, as a species, we are still a work in progress in this regard. Rolf saw structural integration interventions as a means for humans to reach their fullest potential. Rolf often posited that improved body stability improves psychological confidence. Frank took these ideas further by saying "posture, sense of identity, and physical competence are inextricably linked through biology that senses verticality" (2014, 54). Contemporary neuropsychology research has finally caught up with what Rolf spoke of in the 1970s, that "biology is at the root of psychology" and that our biology is a form that has developed in response to and in relationship with gravity (Frank 2014, 54). To have security while standing and moving upright relates directly to our capacity for experiencing psychological security in the world. Structural integration is a touch and movement practice that addresses the body while affecting the biopsychological structures of stability.

To benefit from controlled instability, Frank goes on to say, human bodies have evolved an efficient gravity response system, enabling us to harness, convert, and redirect the forces and kinetics of movement in gravity with a minimum of energy expenditure (2014). An important feature of this gravity response system is the delineation of different kinds of muscles for different tasks. In humans, tonic muscles, acting synergistically, provide the underlying *stabilization* needed for phasic muscles to perform their role as *action* muscles, allowing us to act and express ourselves in the world.

Tonic and Phasic muscles

Tonic muscles are thought of as stabilizer muscles. Along with their associated fascia, tonic muscles provide the ongoing, moment-to-moment stabilization adjustments necessary to keep us upright in the gravitational field. Stabilizer muscles fixate the body, or parts of the body, so that other muscles have a stable point from which to move a body part that is not fixed. A well-known example of a tonic muscle is the *multifidus*, which stabilizes the spine, often working in conjunction with the *transversus abdominis*.

Tonic muscles are slow twitch muscles, that is to say, they consume energy reserves conservatively, which helps them contract for longer periods of time. Tonic muscles are postural. They have great endurance and are well-integrated with the brain and the vestibular system. Tonic muscles are the gravity response muscles, they are engaged in the continuous and ongoing negotiations required for people to stay upright (Frank 1995).

Tonic muscles have a good blood supply and an efficient way of metabolizing oxygen, which gives them great endurance. Being able to sustain prolonged strain is their hallmark, their intrinsic biology allows them to stay *on* for long periods of time. Their excellent blood supply is why they are called red-fiber muscles. Frank (1995) points out how these stabilizer muscles have optimum geometry, optimum stretch receptor density (lending variety to amplitude and timing of their contractions), and optimum linking with fascia, which helps them carry loads better. According to Frank, tonic muscles "are designed for small amounts of action and large amounts of nuanced and economical stabilization" (1995, 15). These muscles work below conscious control, they perform a 'set it and forget it' function, which is essential for us bipeds to meet the challenges of life and movement.

Phasic muscles, on the other hand, are action muscles. Phasic muscles allow us to perform voluntary movements, actions, and gestures in the world. The *biceps* and *triceps* are examples of phasic muscles that perform the action of extending and flexing the arm at the elbow. Phasic muscles are designed for brief bursts of activation and are not meant to stay *on* for long periods of time. Phasic muscles are fast-twitch muscles, which is to say they use up energy reserves very quickly, and they fatigue sooner than tonic muscles. Since they tire so quickly, phasic muscles are not ideal for stabilization. When needed, however, a healthy body will at times recruit phasic muscles for help with stabilization in order to meet unusual or extreme movement challenges

Godard's tonic function model posits that the body works best when moment-to-moment stabilization is left to the predominantly tonic muscles, which we can also call *primary stabilizers* (Bullock-Saxton et al. 2000). There are times, however, when the activity of the tonic muscles alone is not sufficient to hold the body up or keep the body stabilized, especially if it is dealing with larger-than-usual loads or stressors. In this case, phasic muscles can step in momentarily to help with stabilization. The phasic muscles best suited for such situations are called *secondary stabilizers*. Secondary stabilizers, even though they are not designed for ongoing stabilization and do not have the optimal blood supply, geometry, or stretch receptor density, can help when we briefly need greater assistance to keep from falling down. *Tertiary stabilizers* trade-off even more in economy and efficiency of stability than secondary stabilizers. When the body needs the absolute highest resistance to failure, however, tertiary stabilizers can provide robust and dramatic stability (Frank 2014).

A healthy body with adaptive capacity will temporarily recruit phasic muscles for stabilization during usual challenges. Recruiting phasic muscles habitually for ongoing stabilization leads to metabolically expensive muscle use, dysfunctional movement, and poor postural habits that can become ingrained over time.

Anticipatory Postural Activity for Stabilization

The tonic function model calls our attention to evaluating each individual client's specific recruitment of muscles for stabilization as they stand and move in gravity. To do this, we need to consider how the body strategizes the initiation of a movement. If you are standing and you raise your arm in front of you, what are the first muscles to contract? The phasic muscles that control this voluntary movement of the arm? No, it is the muscles on the posterior side of the ankle and lower leg, in particular, the soleus contracts first. Our movement brain anticipates the need for balancing the change in the center of gravity that will result from raising the arm in front of you. The soleus in this case acts as a stabilizer, moving the whole body slightly posterior so that the added weight of the arm moving in front of the body can be negotiated without your whole structure destabilizing.

The coordinated activity associated with this mechanism is called the *anticipatory postural activity* or *pre-movement*. Anticipatory postural activity is an example of tonic muscles providing the underlying stabilization needed for phasic muscles to perform voluntary actions. In Rolf Movement Integration, we frequently direct the client's attention

to their pre-movements that precede an action. We do this as a teaching tool with the aim of bringing about more efficient coordination.

The Psoas as a Case in Point

The psoas is a predominantly phasic muscle, yet may also temporarily serve as a potential tertiary stabilizer, capable of stepping in briefly to aid in stabilization when needed. The psoas' main function is hip flexion during walking. With the support of the transversus abdominis, multifidus, and other stabilizers, the psoas – in a brief burst of contraction – brings the femur forward during the transition from the two-legged stance phase to the one-legged swing-through phase of the gait. During normal walking, the *proximal* psoas attachment serves as the *fixed point* for muscle contraction. Yet, due to dysfunctional movement habits, the psoas is commonly used to perform stabilizing functions.

Ideally while sitting, the upper center of gravity of the chest is positioned in line with the hips, which allows the body to find support and stability by directing the weight down into the ischial tuberosities and the rami of the pelvis. With adequate lumbar lordosis, the person's body weight is stabilized efficiently through the activity of tonic muscles. In this way, skeletal alignment is optimally balanced in the gravitational field (see Figure 4).

When the lumbar curve is lost, flattened, or becomes kyphotic, the rib cage shifts posteriorly. Then, the mass of the upper body is behind the pelvis. Having lost its skeletal support and healthy stabilization function, the body needs to prevent itself from falling backward. How does it do this? A common dysfunctional strategy for maintaining uprightness during sitting is to recruit the psoas as a back 'sling' (Frank 2014). This pattern can be commonly observed both while a client is sitting in a chair as well as when a person sits in a cross-legged position (see Figure 5).

Subverted psoas function can also be observed in certain individuals when they are walking and running. When a person tends to carry the upper center of gravity behind the hip joint, the rib cage will be towed forward by the psoas while at the same time being used to lift the leg out in front of the body to take a step (see Figure 6). In this situation, the psoas has

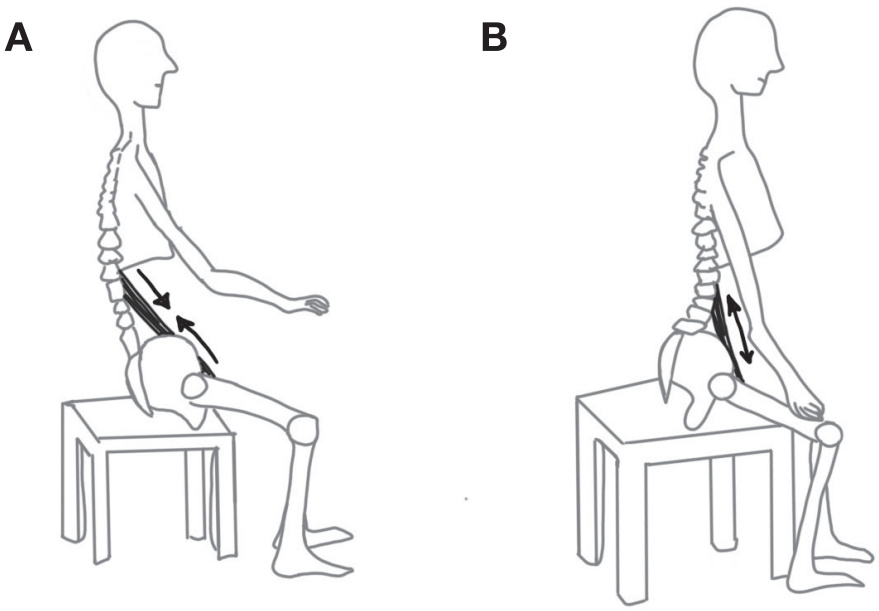

Figure 4: People can recruit the psoas as a back 'sling' with their lumbar curve flattened or turned kyphotic. In this case, the mass of the upper body drops behind the hip joint axis, channeling the upper body weight into the tailbone. This position is a loss of skeletal support from below and the body recruits the psoas as stabilizer, acting as a sling to keep from falling backward (A). In supported sitting, the upper center of gravity is positioned in line with the hip joint axis, allowing the body to maintain adequate lumbar lordosis. Support and stability is found by directing the upper body weight down into the ischial tuberosities and the rami of the pelvis (B).

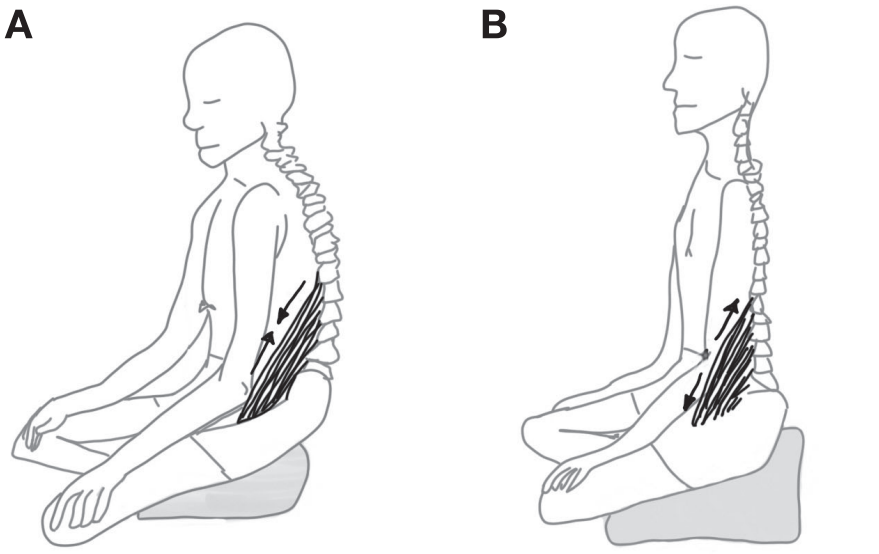

Figure 5: Recruiting the psoas as a back 'sling' while seated in a cross-legged position (A). With a posteriorly displaced upper center of gravity, the weight of the upper body drops behind (posterior to) the hip joint axis. Consequently, due to lost skeletal support, the body recruits the psoas as a back sling to keep the upper body from falling backward. Supported sitting in a cross-legged position (B). With a lordotic lumbar spine and with the upper center of gravity positioned in line with the hip joint axis, the weight of the upper body is almost effortlessly channeled into the ischial tuberosities and the rami of the pelvis.

The tonic function model calls our attention to evaluating each individual client's specific recruitment of muscles for stabilization as they stand and move in gravity.

no secure upper fixed point, while at the same time is being used to hold the spine from falling backward. Over time, the psoas will display a confused stabilization pattern. When secondary and tertiary stabilizers are habitually used for moment-to-moment stabilization like this, coordination and movement economy suffer. When fast-twitch muscles that are designed for quick bursts of action are recruited as stabilizers on an ongoing basis, they tend to become stiff, tense, and inelastic. These events can lead to a system-wide deterioration of motor function (Frank 2014).

With This Information, How Do We Approach our Work?

The tonic function point of view highlights how effort-based, temporarily expedient movement choices can lead to dysfunctional movement habits. Once these habits have become established, changing the pattern is difficult. When clients are engaging phasic muscles for stabilization, they are overriding their movement brain's capacity to operate with ease, compromising the economy of movement. What Rolf referred to as 'random bodies' can be called *confused gravity stabilization* when described from a tonic function perspective.

The solution is to bring the tonic function model into the structural integration session so that we may assist clients to optimize coordination (Frank 2014). When we are doing fascial mobilization with the psoas fibers, we are not repairing damaged fascia. We touch the fascia of the psoas to inform the body about preparation and stabilization in order to restore the movement-brain primacy.

Helping clients attend to sensations is a powerful way to communicate with the movement brain, amplifying the client's triangle of support (the eyes, the feet, the inner ear) can take our fascial manipulations further by deepening our interactions with our clients. Engaging clients in performing specific guided movements, while they attend to their sensations, enables their movement brain to make novel choices. This attention creates the possibility for clients to form new neural pathways with respect to healthy gravity response.

As an example of communicating with a client's movement brain through psoas work, I start with the client supine, knees up, and feet flat on the table. Using a gentle, calm tone of voice, I invite them to feel their sense of weight throughout their body as they simultaneously tune into the feeling of support from the table "coming up" to meet them. While I manually contact their psoas, I invite the client to slide their right leg down. I then invite the client to gently press their left foot into the table to initiate the return of the right leg.

Using touch, dialogue, and guided movement, structural integrators and movement educators help clients attend more deeply to sensation and perception of muscle usage. Through these various interventions, we help bring about a resetting of tonus levels in our clients' musculature and connective tissue. In this state of heightened somatic awareness, and with optimized resting tonus, we guide our clients through movements that give them a taste of what optimal coordination feels like. In this way, we help clients restore good stabilization in the gravitational field and offer a path to develop healthy coordination patterns.

We touch the fascia of the psoas while insisting that movement be slow and well prepared. We touch the fascia of the psoas while insisting on presence

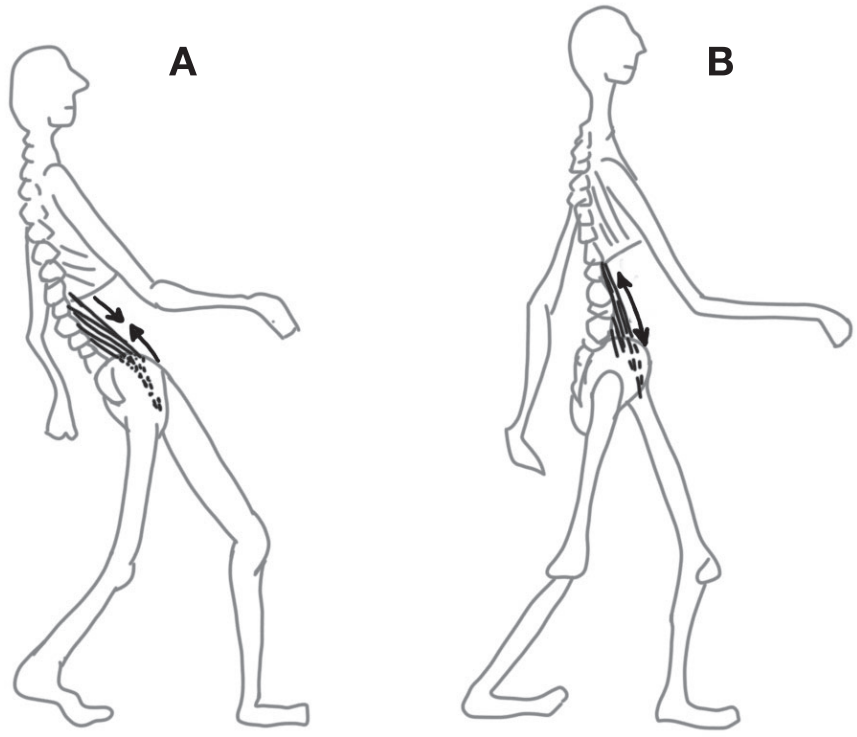

Figure 6: Subverted psoas function during walking (A). The psoas is being recruited to perform a dual function, bringing the femur forward through hip flexion and simultaneously holding the spine from falling backward. Healthy psoas function during walking (B). In a well-coordinated individual, the proximal psoas attachment serves as the fixed point for muscle contraction. Optimally, the psoas fires momentarily and then releases its tension as soon as the femur has been brought forward into the swing-through phase of the gait.

to the sensory landscape of the event. We touch the fascia of the psoas as part of a system-wide restoration of stability . . . We touch fascia to help the brain sort out which body parts need support and fixation and which ones need to act (Frank 2014, 55).

Challenges and Successes in Implementing Tonic Function Methods

The practices informed by the tonic function model required practitioners to engage verbally with clients, using *evocative language* to help them deepen into perception and *directional language* to guide them through movement explorations. Engaging verbally in these ways shifts our clients from cortical thinking toward perceptual sensing of their *felt experience*. Using the tonic function model, we guide our clients into a desired perceptual state and direct them to healthy movement. The use of evocative language and guided movement enables us to offer new possibilities to our client which has the potential to enrich our therapeutic interactions.

As I started to put the tonic function methods into practice, I found that changing my approach to the work wasn't necessarily easy. I felt a lack of fluency and confidence in using this type of language with my clients. As an introvert, I had to push myself beyond my comfort zone as I started incorporating the use of language to make my sessions more interactive and educational. At first, I felt limited in my ability to use words in a way that would successfully connect my clients to their body. Some of the evocative language felt awkward to say and clients sometimes seemed uncomfortable engaging more interactively in response to directional movement prompts. I was surprised to find that my familiar, quiet style of working – where my hands did the communication – had become a comfort zone for me. I found I would revert to my old, less interactive approach.

Rolf Movement Integration helped me make the transition. In Rolf Movement training, students practice the use of evocative language as well as ways to work with clients interactively. As I studied the tonic function model more thoroughly, applying the model through Rolf Movement practices, I shifted from cognitive understanding to embodied belief. I studied the human gravity response system and from that point, the use of language and interactivity came more easily. My excitement for structural integration returned and my results with clients were enhanced. I could now fully embrace structural integration as a form of interactive somatic education and begin to teach others. As a Rolf Movement Integration instructor, I now teach the tonic function model so that structural integration practitioners can better serve their clients as well. My hope is that you will feel encouraged to explore an enhanced style of working with the potential for deeper transformation in the realm of coordination, embodiment, and expressivity.

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tonic function model; Hubert Godard; Kevin Frank; tonic; phasic; gravity sensing; gravity response system; Rolf Movement; vision; feet; vestibular system; otolithic organ; Gracovetsky spinal engine; controlled instability; psoas; anticipatory postural activity; pre-movement. ■