

MEDICAL GUIDES TO
Complementary & Alternative Medicine

*Complementary and
Alternative Medicine in*
REHABILITATION

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The Feldenkrais Method®

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THE NAGI MODEL: REHABILITATION IN A DISABLEMENT MODE

Traditional rehabilitation is based on the World Health Organization (WHO)' model of the relationship among impairments, functional limitations, and disability. Simply stated, *impairments* are problems at the tissue level and include sprains and strains, fractures, and disease processes. *Functional limitations* are problems manifesting in the inability of an individual to complete a task. Asthma is an impairment. Shortness of breath climbing stairs is a functional limitation. *Disability* is defined in terms of an individual's life role. For example, *Mr. Smith is unable to work as a pri-*

mary school teacher because of uncontrolled asthma. In a traditional rehabilitation setting, clinicians would likely identify and attempt to directly ameliorate and/or teach compensations for impairments, functional limitations, and disability.

This is primarily a deficit model: problems are identified and the individual categorized by what he or she cannot do. This construct is also best suited to an allopathic medical model where health is defined by the absence of disease. Although the relationship among impairments, functional limitations, and disability is not linear, the Nagi model is limited in its ability to include the rich background of skills, abilities, and feelings that an individual brings to the healing process.

Somatic Education: Rehabilitation in an Empowerment Mode

Somatic education is the term used to describe somatosensory, kinesthetically based body-centered learning practices that developed at the beginning of the twentieth century from the work of F.M. Alexander^{2,3} (The Alexander Technique), Elsa Gindler⁴ (Gymnastik), Charlotte Selver⁴ (Sensory Awareness), Ida Rolf⁵ (Rolfing), and Moshe Feldenkrais⁶⁻¹⁰ (The Feldenkrais Method[®]), among others. All of these are educational learning models. Other forms of somatic education have continued to develop with the work of Thomas Hanna¹¹⁻¹⁵ (Somatics), Judith Aston¹⁶ (Aston-Patterning[®]), Bonnie Bainbridge Cohen^{16a} (Body Mind Centering), Emily Conrad⁴ (Continuum Movement), Ilana Rubinfeld¹⁷ (Rubinfeld Synergy), and Marion Rosen¹⁸ (Rosen Method), among others. The term *somatic education* comes from *soma*, the Greek word for body. Hanna referred to soma in the specific context of "the body as perceived from within by first-person perception."¹⁴ He heralded "a new manner of thinking of ourselves in the breadth of our biological history and the depth of our physiological reality."¹³ Hanna believed that one's self-image and one's physical self are intertwined: "Self-awareness (or self-consciousness) is a function of experiencing the whole state of one's organic structure, [and] as that organic structure changes, so does our basic self-awareness—and vice versa."¹¹ Others have referred to similar holistic neurobiologically based views of embodiment.¹⁹⁻²²

Somatic Education develops an individual's self-awareness and is a process that educates the *whole* person. The somatically educated self is an embodied, aware, whole self that participates fully in both the secular and spiritual domains. In the Feldenkrais model of somatic education, students delve into their own rich background of skills and abilities and learn how to move out of pain and into ease, pleasure, and spontaneity. Adding a form of somatic education such as the Feldenkrais Method[®] to a program of recovery from injury, disability, or illness can speed up the process of learning self-knowledge, self-care, self-repair, and personal empowerment.

MOVING FROM IMPAIRMENT TO EMPOWERMENT

An impairment model with its focus on the patient as a passive recipient of care is appropriate to physiological trauma and acute medical conditions. However,

when working with chronic conditions such as hypertension, myofascial pain, or asthma, for example, the clinician must alter his or her therapeutic relationship to focus on education, self-care, and patient empowerment. The clinician must also alter his or her professional role from one who cures or "fixes" to one who mentors or guides the healing process. This enables the patient to become an equal partner in the healing process and to take responsibility for his or her own wellness. Somatic Education can furnish a missing integrative link in rehabilitation by involving individuals more actively in their process.

Somatically based approaches such as the Feldenkrais Method may help to unravel the often puzzling findings in patients with abuse histories presenting with nonanatomically based pain syndromes.²³ In a traditional allopathic medical paradigm, such patients are referred for psychiatric care with the unspoken assumption that there is no somatic (anatomical) basis to the patient's pain and therefore the pain must be solely of psychiatric origin. This extreme separation of psyche and soma is in itself nonanatomic as the scientific world begins to confirm the intimate connections between brain structure, brain chemistry, emotions, behavior, and physical functioning in the discipline termed psychoneuroimmunology.²⁴⁻²⁷

SOMATIC EDUCATION WITH THE FELDENKRAIS METHOD[®]

Several philosophies underlie all methods of somatic education: the integration of mind with body, the integration of structure (anatomical architecture) with function (purposeful movement), and self-directed learning within the individual's milieu. Modalities may vary as to the degree to which they emphasize each component. The Alexander Technique and the Feldenkrais Method[®] exist at one end of the spectrum in which function and functional movement is emphasized with structure in the service of function. At the other end of the continuum, Aston-Patterning[®] and Rolfing emphasize a bodywork approach where structure is emphasized and function serves structure. Somatic Education includes aspects of emotional intelligence²⁸ such as self-awareness and empathy, somatic empathy,^{29,30} kinesthetic intelligence, spatial intelligence,³¹ and the care of the soul.³² Somatic Education is an emerging discipline, and consensus regarding its taxonomy has yet to be established. Ongoing dialogue

among somatic educators will undoubtedly clarify which modalities fall under the rubric of somatic education.

The Feldenkrais Method®

The Feldenkrais Method® is a form of somatic/movement education that integrates body, mind, and psyche. It has two complementary components: hands-on individualized Functional Integration (FI) sessions (in which the Feldenkrais Practitioner individually guides a student's movements through touch) and a verbally guided movement exploration called Awareness Through Movement (ATM). A Feldenkrais student does not disrobe while being guided into nonhabitual movement sequences by the touch and/or voice of a certified Feldenkrais Practitioner. Both components are based on sensorimotor developmental learning.^{33,34} Feldenkrais practitioners refer to this as organic learning.^{35,36}

Moshe Feldenkrais, DSc (1904-1984), the method's originator, considered it a teaching rather than a treatment paradigm. He thought of his clients as "students" and his sessions "lessons." This is an important distinction. The Method is not a therapeutic technique to be applied to a set of impairments; rather it is a process of self-exploration by which individuals consciously reconnect with their unconscious sensorimotor selves. This results in increased awareness, new connections created within the self, and increased movement repertoire and cognitive flexibility. The method empowers individuals to *learn how to learn* to regain, maintain, or find new, more efficient functioning through reducing extraneous effort. Within this process, students often begin to see changes in old restrictive habits and find new functional abilities, but the method itself is not primarily for treatment of specific impairments.^{6-10,36-39}

Feldenkrais: The Man and the Method

Moshe Feldenkrais trained in the disciplines of mathematics, engineering, physics, and martial arts. He earned an advanced degree in electrical engineering, as well as a doctorate in physics from the Sorbonne in France. A dedicated scientist (he was Joliot-Curie's research assistant in the area of nuclear fission), he was also a "renaissance man" with a voracious interest in learning. He was one of the first Europeans to earn a black belt in Judo.

As an adult, Feldenkrais sustained serious knee injuries playing soccer. Surgery was recommended, but his prognosis was extremely poor with the surgical technique available at the time. Feldenkrais declined surgery and instead applied his scientific acumen to the problem. This led him to thorough investigations in anatomy, physiology, neurobiology, developmental movement, psychology, hypnosis, learning theory, cybernetics, philosophy, judo, Zen, yoga, exercise, movement therapies, and acupuncture. Feldenkrais incorporated a developmental focus, systematically observing how babies moved through their first 2 years of life. He explored his own movement patterns, recreating developmental milestones, and found ways to decrease unneeded effort in his own body. Despite marked degeneration of his injured knee joints, Feldenkrais was ultimately able, through his careful observations and discoveries, to experience a full recovery of function. He used his experience in the development of what was to become the Feldenkrais Method®. One of Feldenkrais' vital contributions was teaching the importance of movement awareness as a way to improve efficiency and increase one's moving, sensing, feeling, and thinking. Feldenkrais' sensorimotor approach also helped to promote and teach self-care and independence. He believed that Westerners, especially, had been taught to look outside themselves to authorities rather than trust their own knowledge and experience.

Refining the learning processes of FI and ATM, Feldenkrais devised a 4-year, 800-1,200 hour professional training program through which individuals can become certified Feldenkrais Practitioners. (The professional trainings are administered under the nonprofit Feldenkrais Educational Foundation of North America [FEFNA]. See www.feldenkrais.com.) He deliberately designed the training with time between segments for integration of sensorimotor learning and reorganization of the self. Guild Certified Feldenkrais Practitioners must also complete 40 hours of continuing education credit every 2 years to keep their certification current.

In recent years there has been a trend toward more healthcare professionals, including physical and occupational therapists, becoming certified Feldenkrais Practitioners. This has created several dilemmas within the Feldenkrais community as the method becomes more widely applied in therapeutic rather than purely educational venues. There are a plethora of short workshops, seminars, and conferences on the Feldenkrais Method® available for the practicing rehabilitation

professional. However, the method is not simply a tool or technique to be applied for a particular patient problem. It is a process and paradigm of somatic education that is mastered by the Feldenkrais Practitioner during his or her training. When modalities are mixed, the unique Feldenkrais learning outcomes may be compromised. Integrating rather than subsuming the philosophies of somatic education into a more traditional rehabilitation perspective is a vital and necessary paradigm shift. The authors have benefited from referring patients/students to each other in an integrative program of rehabilitation and somatic education.

Recurrent Themes in the Feldenkrais Method®

Non Goal-Directed Learning

The Feldenkrais Method® is a synthesis of what Feldenkrais learned from the fields of engineering, physics, martial arts, and other domains he had mastered. His carefully chosen words on audiotapes with his written instructions reflect this synthesis.

In the phrase "We do not say at the start what the final stage will be," Feldenkrais is setting the stage for non-goal-directed learning. In so doing, Feldenkrais concurred with F.M. Alexander's notion of avoiding "end-gaining."^{2,3,40} When the learner focuses on the goal of movement in this construct, he or she loses focus on the internal processes of awareness that create movement. When focusing exclusively on the goal, learning can be negatively impacted.

Organic Learning

The Method teaches one the links between perception of sensation, intention, and action. The student learns to remain mindful and attentive to proprioceptive and exteroceptive sensations throughout the body while moving and is taught to notice relationships and patterns of relationships between parts of the moving self. Feldenkrais stated, "Our self-image consists of four components: movement, sensation, feeling, and thought."⁶ Organic learning is nonreductionistic in that it does not separate the organism into its anatomical parts but joins those parts into one continuous feedback loop. This feedback loop contains the sensory domain, the motor domain, the affective domain, the cognitive and the spiritual domain. It builds on dimensions such as pleasure and spontaneity.

Skeletal Support

The Feldenkrais student learns in the initial body scan beginning every movement sequence how to sense the skeleton in relation to the resting surface in all positions. This pressure indicates our relationship to gravity. When our movement is light and easy, skeletal support is at its maximum and movement is most efficient. Feldenkrais believed that using the least amount of effort while moving allows for awareness of greatest connectivity between contiguous joints and across several joints. This use of the kinetic chain in function further increases ease and efficiency. Unlike forms of biofeedback where the relaxation component is separated from movement, Feldenkrais students learn how to move while reducing the effort. Thus they are able to bring an awareness of muscle effort, support from the skeleton in relation to the ground, and connectivity into function.

Differentiation/Nondifferentiation

This refers to Feldenkrais' sense of the importance of learning through making distinctions. In ATM and FI a student experiences how to increase ease and efficiency by repeating movements each time with less effort. Students learn to differentiate between necessary and unnecessary contraction of muscles, or "parasitic" movements.

Differentiation also occurs when we choose to move parts of the self either separately in "differentiated" movement or together as a whole in "nondifferentiated" movement. In the Feldenkrais parlance, students through trial and error learn to improve the use of individual body segments as they combine and recombine in new patterns in response to a given task. An example of differentiated movement is glenohumeral movement without scapulothoracic movement, or ankle dorsiflexion with toe flexion/ankle plantar flexion with toe extension. Nondifferentiated movement is movement of body segments in more primitive patterns of logrolling of the trunk, for example, where the shoulder and hip girdles move as one functional unit. Another example of nondifferentiated movement is ankle dorsiflexion with toe extension/ankle plantar flexion with toe flexion.

Habitual/Nonhabitual

Like F.M. Alexander, Feldenkrais believed that we develop problems as we become increasingly out of

touch with and automated in our movements. Most people lose spontaneity and alternatives in their movements as they age. This loss of repertoire may be a risk factor for falls in the elderly. Feldenkrais also believed that we learn best when we are presented with novel stimuli. He emphasized nonhabitual movements to provide learners with new stimuli and novel sensations. Exploring new ways of moving theoretically offers new options to the brain, which reorganizes itself and rewrites the sensory motor cortex, facilitating new, more efficient ways of moving. Also, with stroke⁷ or injury, parts of the brain that were not directly involved in the original movement can learn to perform an action. The brain pathway for the original movement is not exactly reproduced, but an auxiliary pathway is forged.

Whole Body Focus

Feldenkrais emphasized sensing each part of the self in relation to the whole. After scanning their body contact with the floor, students are often amazed to observe how there are missing pieces to their kinesiologically based homunculus. Thomas Hanna,¹⁵ referred to this as *sensorimotor amnesia*. Others have termed it *kinesthetic dystonia*.⁴¹ Through the ATM and FI learning process, students learn to reestablish kinesiologic links to all parts of their bodies. This facilitates the linking of body segments into a kinematic whole for improved function. Students then experience a "river of movement"⁴² that expands throughout the body. Learning to move toward pleasant and away from unpleasant sensations while moving is important for learning in this model. As students experience greater ease in movement reducing effort, they increasingly experience greater connectivity with their skeletal structure.

Proximal Initiation of Movement

From his martial arts, biomechanical, and developmental perspectives, Feldenkrais emphasized the importance of increasing awareness and mobility of the "power center" comprising the pelvis, upper thighs, and hip joints in movement. Other disciplines such as Pilates⁴³ also emphasize strengthening the body from the center outward through certain exercises focusing on the trunk. Proprioceptive Neuromuscular Facilitation (PNF), a form of therapeutic exercise widely used in the physical therapy community, also focuses on the role of the pelvis and trunk in motor control and function. This

"strengthening from the inside out"⁴⁴ is a key component of many of the ATM lessons Feldenkrais and his colleagues devised.

Less is More/Least Noticeable Difference

In using the phrase "It is easy to tell differences when the effort is light," Feldenkrais was drawing on his background as a physicist. The Weber-Fechner law in physics describes the different ratios for stimuli necessary for an individual to detect a difference for each of the senses. For example, when outdoors where there is so much light already, if one lights a match, it is not noticed the way it is when one strikes a match in a darkened room. For an individual to perceive a difference relative to muscular effort, the change must be at least $\frac{1}{10}$ of the original stimulus.⁴⁵ Feldenkrais used the example of how when carrying a refrigerator one would not notice if a box of matches were added or removed, whereas "everybody can tell with closed eyes when a fly alights on a thin match-like piece of wood or straw [one is holding] or when it takes to the air again."⁴⁶ It is only when we are able to reduce the effort in the neuromuscular system that we are able to pick up more subtle differences through sensing. "The lighter the effort we make, the faster is our learning of any skill; and the level of perfection we can attain goes hand in hand with the finesse we obtain."⁴⁸ Feldenkrais' focus on reducing effort through ATM and FI was based on this notion. Through ATM and FI students learn to decrease effort and are able to make finer and finer distinctions when choosing how to move. The less effort expended, the more sensing becomes refined.

Students are also taught the value of imagining movements. Biofeedback has since confirmed that motor neurons fire when the individual is simply imagining the movement.

Active Dynamic Stability

Feldenkrais focused on the dynamic nature of posture. He realized that even when we are standing still we are continually making minor adjustments to maintain our balance. Feldenkrais coined the term "acture"¹⁰ rather than "posture" to convey this constantly moving nature of posture. Many ATM lessons explore subtle movements around the center of gravity through the fluid loss and recovery of balance.

Scientific Support for the Feldenkrais Method®

Neurodevelopmental Underpinnings of the Feldenkrais Method®

There is significant support for the Feldenkrais Method® when we examine its scientific underpinnings. It draws heavily on neurodevelopmental theories in emphasizing a person's sensorimotor and somatically based modes of learning. Recent findings regarding neurodevelopment in the burgeoning field of embodied cognition,⁴⁶ as well as developmental psychology,⁴⁷ point toward a dynamic, experientially based notion of the self. Research in these fields shows that during the first few months of life there is simultaneous development of several senses in cross-modal processing as babies increasingly interact with the world/environment in a global way, using several senses at once. Stern, a psychoanalytically trained child psychiatrist, after extensive video analysis of infants' behavior, revises the old psychoanalytically based view of a passive infant whose nascent self is symbiotically intertwined with that of its mother and concludes that "The sense of self is not a cognitive construct. It is an experiential integration."⁴⁷

The Feldenkrais Method® assumes this integration between sensorimotor learning and neurologically based self-image. ATM and FI lessons help the individual improve his or her sense of self and subsequent patterns of movement. The Method also builds a foundation for emotional intelligence because it involves such human qualities as self-awareness (recognizing a feeling as it happens) and empathy (recognizing emotions in others).²⁸ The Feldenkrais Method® fosters the development of a particular kind of somatically attuned empathy in both practitioner and student—somatic empathy whereby we learn to feel into our own experience, as well as to sense and observe others' somatic experience.³⁰ Learning kinesiologically with somatic empathy can help mental health counselors develop empathy by better sensing their somatic sensations as they empathically attune to their clients.⁴⁸

Sensorimotor learning shows whole body involvement in relating to the world on a nonverbal, nonanalytical level. This is also called *procedural learning* or knowing "that."⁴⁹ With the development of language, a baby's sense of self undergoes a transformation that results in bringing him or her farther away from pure procedural learning into *declarative learning*—or "know-

ing what." Declarative learning is language based, memory dependent and analytical.⁵⁰ Thus it is susceptible to cognitive distortions that can impair functioning. The Feldenkrais Method® relies not primarily on verbal feedback but on kinesthetic and sensory feedback in the learning process. This focus on procedural rather than declarative knowledge is presumably less prone to conscious interference or distortions. From the Feldenkrais perspective, "Language breaks the body into separate parts: the hand, the wrist, the arm, etc., [that] create a fragmented 'body of thought' apart from our unified organismic body."⁵¹

Somatic Education and the Embodied Mind

Findings in neuroscience and embodied cognition^{19,21,22,52} have challenged the mechanistic model of the brain as the central processor, or "software" with the body as the output generator.²¹ Just as Lashley could not localize the engram of a given memory in the brain, neither is there a specific geographical location of any given motor plan.⁵³ Organization is distributed throughout the brain holonomically.⁵⁴ Part of Feldenkrais' genius was in recognizing the nonlinear nature of human development. We transition back to an earlier developing part of the brain—the sensorimotor cortex and bring it to the fore again in recalibrating ourselves toward balance and homeostasis. Sensorimotor learning modes do not become obsolete as we develop. Thelen and Smith²⁰ in observing the development of motor learning in infants, argue for a model of nonlinear dynamic systems constantly in flux. Thus in this view, the embodied human self is continually changing in interaction with its context, and development is not linear and stage-like as in Piaget's view. Behaviors appear and then recede into the background until they reappear in a more sophisticated form later on. As Thelen states, "The grand sweep of development seems neatly rule driven. In detail, however, development is messy."²⁰ In essence, the mind and the self emerge from that complex, messy interaction between the brain and the body in a constantly shifting environment.^{19,21,22,52}

Learning requires both internal and external feedback in the context of environmental cues. The strength of the Feldenkrais Method® is in teaching the student to remain fully aware of the interaction between external feedback (environment) and internal feedback (self) while sensing and directing movement. In this way our sense of self is always developing in relation to our movement, and as our movement

changes so does our sense of self. In using another computer analogy, it's as if the software rewrites itself and reconfigures the hardware both in relation to the output and the quality of its own process.

The Feldenkrais Method®, Neuroscience, and Motor Learning

Research

Areas that are virtually exploding in the literature are those of neuroscience and motor learning.⁵⁵ A recent Medline search showed over 17,000 citations referencing motor learning alone since 1977. If we examine the literature, there is much to indicate basic scientific support of the underlying principles of the Feldenkrais Method®.

Georgopoulos⁵⁶ presents compelling evidence of the involvement of both motor and cognitive processes in the production of motor tasks. He cites numerous studies using electroencephalography (EEG), magnetoencephalography (MEG), positron emission tomography (PET), functional magnetic resonance imaging (fMRI), and transcranial magnetic stimulation (TMS) that have clearly demonstrated that the motor cortex is involved in all aspects of motor learning, motor memory, and motor imagery. There is strong research support for the engagement of the motor cortex with imagined movements in the absence of movement execution. Further research on rats, primates, and humans shows that learning can change the motor cortex throughout the lifespan. Bizzi and Mussa-Ivaldi⁵⁷ postulate that motor learning requires the building of internal models in the brain/central nervous system (CNS) and that the model is distributed throughout many structures including sensorimotor cortex, basal ganglia, cerebellum, and spinal cord. This model highlights the connectivity between elements in the CNS and shows that one's learning takes place in the context "of repeated exposure to sensory signals coming from [] moving limbs while [] interact[ing] with the environment," (pp. 97-98, emphasis added). Their work implies that highly complex motor skills can be learned through the formation of new complex internal models built from interactions of more simple ones.

To investigate the complex relationship between learning, pain, and anxiety, Sieve et al⁵⁸ conducted a study exposing rats to varying doses of a presumed anxiogenic in various adverse learning situations.

Their findings indicate that panic undermines learning in Pavlovian fear conditioning. They suggest that panic inhibits pain and that some pain sensitizes the organism to prepare for and respond to danger. If we extrapolate their findings to humans, this panic state may be elicited by abuse and may inhibit somatic learning and appropriate self-protection in patients with abuse histories.

Evidence for Efficacy

Because the Feldenkrais Method® is not considered by its core practitioners to be a therapy, there is very little in the research literature on its application in rehabilitation. In the English language literature on MEDLINE, there are only a handful of relevant references to the Feldenkrais Method® between 1977 and 2001.

Johnson et al⁵⁹ compares the Feldenkrais Method® to sham (nontherapeutic) bodywork on the physical status, mood, and ADLs of individuals with multiple sclerosis (MS). Results in this small sample showed significant decrease in anxiety with the Feldenkrais sessions as compared with the sham bodywork sessions. There were no significant differences seen in any other markers, including MS symptoms, function, or UE performance. There was some evidence for a trend to higher self-efficacy with both the Feldenkrais and the sham bodywork. This may reflect the powerful effect of touch even in the absence of "therapeutic" work. However, apart from the generic effect of touch, The Feldenkrais group experienced decreased anxiety. It would be of interest to repeat this study with a larger sample size and additional functional markers.

Bearman and Shafarman⁶⁰ sought to assess the efficacy and cost effectiveness of the Feldenkrais Method® in the treatment of chronic pain. In this pilot study, a group of seven patients with refractory chronic pain with pain-related medical costs in excess of \$1000 per year was enrolled in a program consisting entirely of the Feldenkrais Method®. The program was primarily composed of group ATM lessons, with a limited amount of individualized FI. Patient mobility, perception of pain, and total healthcare and pharmacy costs were measured. The authors used the American Academy of Pain Management's National Pain Data Bank (NPDB) test instrument prestudy, immediately poststudy, and 1 year poststudy. Per member per month healthcare costs decreased from an average of \$141 (for the year preceding the study) to an average of \$82 (for the year following the study). This was primarily a

descriptive study with a small population and no true control group (although the authors did compare their patients to like patients enrolled in small, multidisciplinary pain management programs who had also completed the NPDB instrument). Nonetheless, it is an interesting first step in assessing the potential effectiveness and cost effectiveness of intervention with the Feldenkrais Method®.

In 1999 Lunblad et al⁶¹ compared the Feldenkrais Method® with physical therapy or no treatment on head and shoulder complaints in a population of female industrial workers with neck and shoulder pain. In this study 97 workers were randomized into the three groups. Participants were treated for 16 weeks and a posttest was conducted one year after the conclusion of treatment. Results indicated that the Feldenkrais group showed significant decreases in neck/shoulder pain and disability during leisure time. The physical therapy intervention group showed no change in base complaints. The control group showed worsening of symptoms.

Gutman et al⁶² showed no significant difference between the FM and conventional exercises in an elderly population. In this study, tenants in a retirement community were assigned into three groups: a Feldenkrais intervention group, a conventional intervention group, and a no-exercise group. There were no significant differences seen among groups on any measure, including blood pressure, heart rate, balance, flexibility, morale, perception of health, ADLs, and pain. It is likely that the measures used here were not sensitive enough to detect difference in this population because some difference between the two intervention groups and the no-exercise group just as a byproduct of the Hawthorne effect would be expected. Small sample size and insufficient randomization of the groups were problematic as well.

In general, the research literature on the effectiveness of the Feldenkrais Method® is sparse and poorly designed. Most of the literature that exists on the Method is in the form of anecdotal reports, nonscientific publications, and books written by Feldenkrais Practitioners.^{36,37,63} This dearth of peer-reviewed, scientific literature does not mean that the FM does not have value but merely that, as in many other arenas, it has had little systematic study. In addition, the researcher must choose appropriate instruments that will do justice to the experience of somas. Different qualitative research approaches lend themselves to capturing the subjective and phenomenological experience of a soma than those measuring range of motion.⁶⁴

Much of what Feldenkrais postulated in the 1940s until his death in 1984 is being borne out through basic science research on the brain in the fields of neuroscience and motor learning. Now that the tools exist to track changes in the brain with learning, we are able to see what Feldenkrais saw in his detailed and meticulous observations of human movement so many decades ago: We can continue to learn and change through our whole lives, we constantly access both internal and external cues in our movements, we have the capacity for much higher skill and discrimination in our movement than we usually use, and our movement patterns and our self-image are inexorably linked. These ideas are illustrated in the case study that follows.



A Case Study

Chronic Myofascial Pain

This case illustrates how the Feldenkrais Method® enables change in perception and sensation of anxiety and pain. The student develops awareness through creative exploration of movement and regains function while learning self-empathy and self-esteem.

A is a 37-year-old right hand dominant unmarried female who is a professional string player currently working part-time as a freelance musician. Chief complaints: Pain in the left side of her neck and shoulder blade, both hips, and thighs; constant pain (6/10), which increases when playing and performing (10/10); and sitting and walking increase pain.

History

Pain began in 1995 without specific physical event.

Functional Limitations

1. Inability to manage chronic pain and anxiety
2. Limited ability to hold and play her viola/violin and to use bow without increased pain
3. Inability to sit without pain
4. Inability to lie down without pain (10/10)
5. Difficulty walking more than 5 minutes

Psychological Limitations

1. Heightened anxiety, depression, and low self-esteem resulting from persistence of
 - Myofascial pain and dissociation from her somatic experience
2. Hypercritical negative self-talk ("... pray that I would somehow be able to hold on until the end of the piece not knowing how to play the correct notes in the correct rhythm and feeling stupid and self-critical.")

3. Inability to improve musically according to her and her teacher's perception of her potential ability to play her instrument
4. Parents' denial of her being sexually abused by family friend at 5 years of age

Previous Medical History

Surgical removal of left parotid gland resulting from swelling and calcium deposits in 1995.

1. Physical treatment (without success)

- Physical therapy, occupational therapy
- Chiropractic, acupuncture, Massage Therapy, Alexander Technique of Somatic Education, Medical Intuitive
- Yoga

2. Psychological treatment

- Several courses of psychotherapy (before onset of her myofascial pain) for inability to express herself emotionally or musically and difficulty with sexual relations
- Psychotherapy focusing on issues of sexual abuse (weekly, 6 years); psychotherapy group for survivors of sexual abuse (1½ years)
- Psychiatric consultation for psychopharmacological workup resulted in her referral to OC for Feldenkrais in summer 2000

3. Medications: Tylenol prn

Posture

1. Static

- Head held anterior to pelvis
- Both shoulders internally rotated, left: right
- No clear standing leg
- Tendency to hyperextend both knees when standing

2. Dynamic

- Habitually initiating movement with head
- Little sense of support of movement from below (base of support)

3. Palpation

- Excess effort in both left and right trapezius and rhomboids and erector spinae and serratus
- Excess effort of upper and lower arm muscles bilaterally
- Excess effort of upper and lower leg muscles bilaterally

4. Body scan (supine)

- Midthoracic spine, left and right rib cage not contacting the table surface
- Breathing movement only in upper chest

5. Initial movement exploration (supine)

- Head turns easier to left than right
- Difficulty rolling legs medially and laterally and tilting knees
- Intrusion of abuse memories, especially when OC touched upper left shoulder

6. Goals

- Reduce anxiety and depression in playing instruments
- Reduce pain in playing instruments
- Develop more confidence in playing and performing
- Increase her stamina in playing and performing
- Sit more comfortably
- Walk more comfortably
- Eliminate tendency to dissociate from physical sensation in playing and performing
- Lessen and/or alleviate intrusion of abuse memories

Feldenkrais Somatic Learning Course

1. Weekly, then biweekly Feldenkrais lessons with A in summer 2000

- OC recommended consultation with rheumatologist to rule out fibromyalgia
- Rheumatologist diagnosed myofascial pain
- OC supported A's taking a break from all playing and performing for 5 months

2. Feldenkrais Lesson Plan: Functional Integration (FI) and individualized Awareness Through Movement (ATM) lessons

- Help A to sense different body parts in motion through differentiated and undifferentiated movements
- Help A to increase her ability to move as a whole self, including the pelvis
- Help A to reduce effort (less is more) through FI and ATM lessons
- Help A to observe self and nurture self without overly self-critical judgment

3. Progress report after 1 year of Feldenkrais lessons: FI (1½ hours) with individualized ATM sequences twice a week for 4 months; FI/ATM once a week and occasionally twice a week for 8 months, supplemented by ATM group class for last 6 months. Student reports she is able to

- Lessen her pain when playing and performing
- Practice and perform for longer duration
- Remain present and not dissociate from her body while playing and performing
- Sit more comfortably at her computer
- Walk without pain for periods of longer duration
- Decrease negative self talk and hypercritical stance
- Experience a greater sense of self-efficacy
- Experience lessening of her depression and anxiety
- Control intrusion of memories of abuse so as not to feel overwhelmed by them
- Engage in ATM to alleviate her pain when holding and not holding her instruments
- Participate in OC's weekly group ATM class since January 2001 (Student was unable to participate when she initially tried to join a class in October 2000)

because of anxiety, pain, and intrusion of memories of abuse)

Student has seen her psychotherapist for four sessions since beginning Feldenkrais work with OC up through December 2000.

Recommendations

A hopes to resume a full schedule of playing and performing. OC suggests that she continue weekly or bi-weekly FI lessons and continue participating in weekly ATM classes over the next 3 months.

This case illustrates the importance of an integrative approach including somatic education for effective recovery from psychophysical symptoms of sexual abuse. The patient was able to return to employment after not having played publicly for 5 months. After her first two concerts, she experienced a pain level of 6/10. She then stopped and engaged in her ATM movements, reducing her pain considerably and was able to play three performances the next day with an increasing sense of competence and self-efficacy. She has reported successfully



Sample ATM Lesson

The Pelvic Clock

This lesson is done while lying on your back.

Begin by bending your knees with your feet flat on the floor. Visualize a clock face painted on the back of your pelvis: 12 o'clock is at the center of the lumbar curve, 6 o'clock is at the center of the tailbone, 9 o'clock is at the right side of the pelvis, and 3 o'clock is at the left side of the pelvis.

1. Gently, slowly, and easily press your pelvis toward 12 o'clock, then rest.
 - Does the low back flatten?
 - Is this the same as doing a pelvic tilt?
 - Can you continue to breathe while moving to 12 o'clock?
 - Do you breath in or out as you move to 12 o'clock?
2. Gently and easily, using small slow movements, press your pelvis toward 6:00, then rest.
 - Does the low back arch?
3. Gently and easily, press your pelvis toward 9 o'clock, then rest.
 - Do your legs tilt to the side? Do they have to?
 - Does the left side of your pelvis lose contact with the mat?
 - What happens if you gently push on your left foot while moving your pelvis to 9 o'clock?
4. Repeat to 6 o'clock.
 - Notice whether you move with ease or with difficulty to each of the four cardinal points on the clock.
5. Stretch out your legs and take a break.
6. Return to bending your knees with feet standing.
7. Gently press your pelvis toward 12 o'clock, then allow your pelvis to roll toward 1 o'clock. Swing back to 12 o'clock, then rest.
8. Gently press your pelvis toward 12 o'clock. Roll to the 1 o'clock position, then to the 2 o'clock position, then rest.
9. Continue to expand the movement until you are rolling from 12 o'clock to 3 o'clock. Return to 12 o'clock, then rest.
 - Notice if there are points of the clock that are more difficult to feel than others.
 - Is the movement smooth, like the sweep second hand of a clock? Or jerky and ratchet-like?
10. Now begin by gently pressing your pelvis toward 6 o'clock. Allow your pelvis to roll toward 5 o'clock. Swing back to 6 o'clock, then rest.
11. Continue to expand on the movement as before, first to 4 o'clock, then 3 o'clock. Keep the movements smooth and light.
12. Allow the pelvis to move in a continuous arc from 12 o'clock to 6 o'clock.
 - Notice if there are points of the clock that are more difficult to feel than others.
 - Is the movement smooth, like the sweep second hand of a clock? Or jerky and ratchet-like?
13. Repeat this sequence for the other side of the clock.
 - Allow yourself sufficient resting time. Do not move through pain.
14. Conclude the clock exercise by moving around the entire circle.
 - Can you allow the movement to mimic the sweep second hand (i.e., smooth and continuous)?

rehearsing for 4 hours with no pain. A sample ATM lesson is contained in the box on p. 48.

In FI lessons, the patient became aware of her fear that the perpetrator would attack her when she was playing her instrument. In learning how to independently engage in ATM movement sequences, she was able to alleviate discomfort during and after performances. She was able to improve her performing and her ability to nurture and care for herself. The patient realized that she had first learned to feel safe in her body with OC while receiving FI. She was able to take this sense of safety into other situations when she was without OC. Through the Feldenkrais Method®, the patient learned a different way of listening, sensing, and empathizing with her own somatic experience. She also began to validate her own sensing and feeling in an embodied way.

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