

Low-Stress Computing

Using awareness to avoid RSI
A Feldenkrais® Perspective

Chapter 1 Introduction

by
Ralph Strauch

**Somatic
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Note

This document contains the introductory chapter and table of contents to a preliminary version of *Part 1* of a book on *Low-Stress Computing: Using Awareness to Avoid RSI, A Feldenkrais Perspective*. The full text may be purchased in hardcopy using the enclosed order form, or in hardcopy or pdf format from the Somatic Options website at www.somatic.com/low-stress.html

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Low-Stress Computing Introduction

Once upon a time, the term “hazardous occupations” applied primarily to occupations like working in a mine, logging, or bridge building — jobs involving the risk of sudden, violent injury or death. Today, the term must also be applied to office work, computer programming, newspaper writing, and working as a supermarket checker — occupations that superficially appear to have few hazards associated with them.

The hazards in these occupations are not sudden, massive, and violent. On the contrary, they are insidious and cumulative — a thousand tiny taps instead of a single massive blow. They are the hazards created by doing the same thing over and over again, so that individually negligible stresses accumulate to the point of injury. Someone typing 60 words per minute will strike 20,000 keys per hour — perhaps 120,000 keys in the course of a day, accounting for breaks.

The injuries and disabilities resulting from these hazards are described by names like *repetitive stress injury*

(RSI), *repetitive strain injury* (also called RSI), *cumulative trauma disorder* or *syndrome* (CTD or CTS), and *overuse syndrome*. These injuries disable millions of workers, at least temporarily, at a cost to the economy of billions of dollars per year.

The usual explanations for these injuries focus on the repetitive nature of the work (*e.g.*, on typing or handling groceries at the check-out counter) or the design of the workstation (biomechanically poor chair or keyboard design, etc.). These factors are significant, to be sure, but they don't tell the whole story. Repetitive stress injuries flow from the confluence of the *nature of the work*, the *design of the workplace*, and the *behavioral habits* that you bring to the task and use (albeit unconsciously) to organize the way you do the job.



Our focus here will be on that third branch of the stream — the unconscious habits which organize your actions and the unconscious choices which support those habits. We will explore the ways those choices affect your actions, and how you can learn to change those choices and work in ways that impose less strain on yourself.

Most people *work too hard* at what they do, in the sense that they exert more effort than the job actually requires. This extra effort doesn't dissipate harmlessly into the ether. It produces compressive forces within the body,

which impose the extra mechanical strains that eventually lead to RSI. You do this because of a lack of self-awareness — you literally do not know what you are doing to yourself, or what alternatives are available. That can change.

Am I “blaming the victim?”

Because I focus on what you do to yourself, rather than on what the workplace does to you, I have been accused of “blaming the victim,” of being an apologist for heartless employers who aren’t willing to provide a safe workplace. *That is not my intention.* I don’t see what I say as *blaming* someone who suffers from RSI. Rather, I see it *empowering* them to change their condition, irrespective of what anyone else does.

When I say you *can* do things differently, I’m not saying that you *should have been* doing them differently all along. I’m asking you to question deeply ingrained cultural habits, ways of thinking and acting that we all learned as children and accepted uncritically as *how things are*, without ever thinking about the fact that we had choices. I’m suggesting that it’s time to rethink those habits, to see if we want to continue to pay the prices they extract from us. If not, then it’s time to change them. I will show you how to do that if you choose to.

If your own behavior contributes to your RSI, then you can reduce your vulnerability to RSI through your own action, whatever your workplace environment. This doesn’t mean that your RSI is “your fault” and your employer has no responsibility for it. It doesn’t reduce your employer’s responsibility to provide a safe workplace, and to modify that workplace if necessary to make it safe. It does suggest a new tool which employers can employ to achieve a safer workplace — education to

make employees more aware of the behavioral changes that will reduce their risk, and support for them in making those changes.

To provide this kind of support, employers must become more knowledgeable about the problem of RSI and the sources that contribute to it. Those that do so should become more sympathetic to the problem and more willing to address it, rather than to ignore it and hope it will go away. The approach I advocate does not excuse or apologize for employers who are unwilling to deal with the problem. On the contrary, I see it as a way of encouraging them to do more about it, and as providing new tools to support that.

Scope and terminology

People apply many different terms to the kind of difficulties we're dealing with here, and different people define those terms with different degrees of specificity. I'm going to use the term *RSI* as a generic term for injuries resulting from repetitive activities like typing, shelving books, or working on an assembly line. I'm avoiding terms like syndrome or disorder, because these terms have medical diagnostic connotations. I will not be dealing directly with medical diagnostic categories such as carpal tunnel syndrome, thoracic outlet syndrome, or ulnar nerve impingement, but will be looking at the problem through a somewhat different lens.

I'll be concerned with how you organize your movements, actions, responses to the world, and how that organization imposes stress on your body. And I'll be concerned with how you can change that organization to avoid or reduce that stress. I'm calling this way of looking at the issue a "*Feldenkrais* perspective" because it grows out of my experience as a practitioner of the *Feldenkrais*

Method over the past 13 years. Later on I'll draw a more explicit comparison between this perspective and the more familiar medical perspective, to see how they both contrast with and complement each other. For the time being, though, I'll just let the ideas unfold as we come to them.

This is a different lens than you may be used to looking through when you look at these problems, and may require some conceptual shifts and new conceptual categories. I'll lead you through experiential explorations intended to help you facilitate those shifts and make them meaningful. Please take enough time with these explorations to allow that to happen. The benefits from this approach come from changes in the way you experience yourself. If you approach what I have to say from a purely intellectual perspective those changes won't happen.

I'll use the term *exploration* to describe short exploratory experiences which I will guide you through, and later to describe the larger overarching process of change on which I hope to induce you to embark (which I'll call *somatic exploration*.) I'll use the term *lesson* (as in *Awareness Through Movement* lesson) to describe more structured learning experiences with specific learning objectives. I will use a different typeface, like this, for directions which I hope you will follow and experience.

I am deliberately avoiding the term *exercise*, which is sometimes applied to experiences like these. My reason for this is to emphasize the *learning value* of these experiences. *Exercise* carries a connotation of "something you can do without thinking about it, in which the benefits are derived from the effort you put into the mechanical performance of the act." That is not the case here. The benefits of these explorations and lessons derive

from the information you acquire from them, and the learning which that information makes possible. Effort is not desirable, because it often interferes with learning.

Causes & prevention of RSI

Let's look at the term RSI, or *repetitive stress injury*, and see what the term itself can tell us about the problem it describes.

- **Repetitive** — something you do over and over
- **Stress** (or strain) — that imposes stress (or strain) each time you do it
- **Injury** — leading to injury or disability

Broken down into it's components like that, the meaning of the term is obvious.

Doing something over and over in ways that impose stress or strain each time you do it will eventually lead to injury.

Typing is a highly repetitive act. If you type at an average speed of 60 words per minute, you will strike the keyboard 20,000 times per hour. If you put a little extra strain on your body with each keystroke, it can add up.

I'm not going to take a position on whether the "S" in "RSI" should stand for "stress" or for "strain." The term is equally descriptive (and valid) either way. In physics, the term *stress* refers to an external force which tends to deform a physical system, while *strain* refers to the resulting deformation. In the current context a similar distinction appears useful. I will apply the term *strain* to negative impacts on body tissues, such as tension in muscles and tendons, friction between tendons and the structures they move against, pressure of one tissue

against another, etc., and the term *stress* to the stimuli (both external and internal) which produce those impacts. Thus strain is the direct cause of injury, while stress, in turn, is what leads to that strain. We can sum up the relationship between stress, strain, and injury, then, as follows:

Repetitive Stress → Repetitive Strain → RSI

This analysis suggests two approaches to reducing and preventing RSI:

- (1) reducing the stress associated with each individual action, and
- (2) reducing the *effective* number of repetitive actions.

I've included the qualifier *effective* in (2) because it may not be possible to reduce the *absolute* number of repetitive actions required by the job that needs to be done. Typing that manuscript sitting in front of you may require a half-million keystrokes, and there's no way of getting around that. The impact of those half-million keystrokes on your body can be significantly reduced, though, by breaking them up into smaller bunches and giving yourself a chance to rest and recuperate between the bunches.

Our principle focus will be on (1), on understanding how you can reduce the stress associated with each individual action — the amount of force you put into each individual keystroke, for example, or the tension with which you move the mouse. In this way, you can turn your current high-stress, RSI-prone style of computing into a more low-stress, RSI-free computing style.

Environmental and behavioral stress

The stresses that working at your computer (and indeed, life in general) impose on you fall into two classes — *environmental* (or *external*) and *behavioral* (or *internal*).

Environmental stresses come from the world around you. Sources of environmental stress include poorly designed furniture and equipment, inadequate lighting, excessive work schedules, and the like. Environmental stresses are important, and the whole science of ergonomics has grown up to deal with them.

Behavioral stresses are those you impose on yourself by the way you work and the way you organize your body as you work. These include the stresses you produce by slouching or holding yourself rigid as you work, for example, or by typing with your wrists bent and too much tension in your arms. They also include the stresses you impose on yourself by hurrying (which, we'll see, doesn't really get things done any sooner after all); by being angry at your boss, your mate, or your kids; or by going around all day with tight shoulders and a locked jaw.

Common approaches to reducing work-related stress focus on reducing environmental stresses through things like split keyboards, ergonomic chairs, and better lighting. If behavioral stresses are addressed, it is likely to be with environmental solutions — ergonomic chairs to improve posture, wrist braces to support your carpal tunnel when you type, etc. The underlying behavioral patterns that produce behavioral stress are taken as given, as part of how people are and impossible to change. That isn't true; you can learn to significantly reduce the behavioral stresses you impose on yourself.

Significant behavioral change is not easy. It often seems like the more you try to change, the more stubbornly

unwanted behaviors resists change. Admonitions like those you heard as a child to “straighten up and don’t slouch” only seem to make it harder to comply. This is because you attempt to make change at the wrong level — to change the surface behaviors, like slouching or typing with bent wrists, without attending to the underlying behavioral substrate on which those behaviors rest.

You slouch in part because excessive tension in the front of your ribcage pulls you forward and down. When you try to “straighten up,” you tighten your spinal extensors to pull yourself upright, while maintaining the tension in your ribcage. The muscles in your chest and the muscles in your back fight against each other, one pulling you down and the other pulling you up. You may temporarily overcome the slouch and “sit up straight” with effort, but it takes more effort than you can maintain over the long run.

The slouch isn’t really the problem. Rather, it is a manifestation of deeper systemic habits. That chronic effort in the front of your ribcage is one of those habits. As you habituate to that effort, you become unaware of it. The effort and the tension it produces blend into the background, as unnoticed as the pressure of your clothing against your body.

Trying to “sit up straight” doesn’t work because it focus on the surface behavior (the slouch). The underlying behavioral substrate is not easily accessible to direct volitional control. To truly change, you must change that underlying substrate. That must be done indirectly. The direct approach doesn’t work.

The approach developed later will be based on changing that underlying substrate through increasing self-awareness. By consciously *noticing* how you move and how you act, you make new information available to the

subconscious processes which organize and control those movements and actions. Your nervous system can use that information to improve your movement. Conceptually, the process is simple, though implementing it is not necessarily easy.

One of the tools you can use in this process is a somatic (body-oriented) teaching technique known as *Awareness Through Movement*[®] (ATM), developed by an Israeli physicist named Moshe Feldenkrais. *Awareness Through Movement* uses gentle movements and directed attention to enhance your awareness of how you move and what you do that gets in your way. You discover new ways of moving and acting. Layers of habitual tension relax and melt away, and your movement and action become easier and more fluid. As you integrate these changes into everyday activity, you reduce the behavioral stress you impose on yourself. This, in turn, reduces your vulnerability to RSI.

A series of *Awareness Through Movement* lessons on audiotape will supplement the later chapters of this text. *Movement explorations* within the text lead you through experiences similar to those in the ATM lessons, though in a shorter and less comprehensive form. These lessons and movement explorations will allow you to experience changes in the ways you organize your action and your awareness. The accompanying explanations will help you understand those changes and give you strategies for integrating them into your daily life.

This form of learning can take place at very deep levels, levels initially below the threshold of consciousness. This produces something akin to an “operating system upgrade,” and will do more than just reduce computer-related injury. The changes thus produced can generalize and extend to other aspects of life as well, increasing ease and fluidity and making life

more comfortable and rewarding.

Overview of what's to come

Three primary sources of behavioral stress contribute to the mechanical strains that eventually lead to RSI.

- **Excessive Effort**
- Other forms of **Poor Body Organization** , and
- **Lack of Self-awareness** .

The next six chapters will focus on understanding these sources and the ways in which they contribute to the mechanical strains which lead to RSI. We'll see how each comes about, and how it increases your vulnerability to RSI.

We will then look what you can do to reduce behavioral stress, through a process we will call *somatic exploration*. Simply put, that process involves noticing how you move and using the information gained to improve the quality and ease of your movement. We'll examine some tools you can use to facilitate that process.

That will conclude this part of the book. Additional chapters will be released in coming months. The first of those chapters will be organized around somatic themes which have a strong impact on your vulnerability to RSI. The specific themes we will examine are

Supporting yourself in gravity

Supporting yourself in gravity is one of the most basic and fundamental of human activities. So fundamental is it, in fact, that it becomes largely automatic, and you probably have little awareness of how you do it.

Your physical support in gravity is divided between

two systems — your skeleton and your muscles. Ideally, the weight of your body should be balanced on your skeleton. The primary role of your muscles should be to align your skeleton to provide that balanced support.

We will explore the mechanics of this support experientially, allowing you to feel the role played by different parts of your skeleton and the patterns which connect those parts. As you learn greater awareness of balance in gravity, effort and strain decrease and everything you do becomes easier and more fluid.

Broadening your awareness

Your *perceptual field* is the field of awareness through which you experience yourself and your interactions with the world around you. That field can be broad, or narrow. In fact, it's breadth changes constantly as you move from one activity to another. These changes are largely unconscious, and much of the time your field is probably narrower than it should be for optimum functioning.

We will examine the way you manage your perceptual field, and explore the changes that take place as it broadens and narrows. You will be able to experience the limits that a narrow perceptual field impose on you, and begin to develop the skills necessary to maintain a broader awareness as you work.

The relationship between awareness, tension, and the perception of time plays a particularly important role in behavioral stress. Tension narrows awareness, and narrowed awareness makes time seem to go faster. This leads to what I call the *hurry-up fallacy*, the illusion that you can get things done faster by tensing. We will examine this illusion and it's consequences, and see what you can do to overcome it.

Acting as an integrated system

Everything you do involves all of you, whether you are aware of that or not. When your perceptual field is narrow, you tend to fragment yourself into pieces. You hold most of yourself rigid, and fight against the natural connections between different parts of yourself. This fragmentation is a major source of mechanical strain within your body.

We will explore the experience of fragmentation, and of using your body as a more integrated whole, and show you skills which will help you learn to function in a more integrated way.

Maintaining your center

We will tie these ideas together through the theme of *maintaining your center*. When you are balanced on your skeleton, broadly aware, and functioning as an integrated system, you experience yourself as having a clear center around which everything you do is organized. As you tense and narrow your awareness you lose that center, and the focal point of your activity shifts elsewhere.

We will explore the experience of being centered, and of losing and regaining center. You will feel the stresses that the loss of center imposes on you, and reduction of those stresses that regaining center brings. We will introduce you to the skills necessary to maintain more of your center on a more ongoing basis.

* * * * *

The written explorations provided in the text will be supplemented by *Awareness Through Movement* lessons on audiotape, exploring the material in greater experiential depth. I hope to make these lessons available on the Internet as *RealAudio* files, but haven't actually played

with the technology yet to see if that's possible.

Additional chapters will deal with a range of issues and questions about aspects of *Low-Stress Computing* not otherwise covered, and about the relationship of *Low-Stress Computing* to other ways of dealing with RSI. Those chapters are not fully mapped out yet, but the subjects to be covered will include:

- The relationship between the perspective developed here and
 - the medical model,
 - conventional exercise programs
 - alternative therapies such as acupuncture, bodywork, nutritional therapies, etc.
- The relationship between behavioral and environmental stresses, and what the ideas presented here have to say about ergonomic changes.
- The nature of habitual behavior and what is involved in changing it.
- Strategies for change, and specific tools to help.

One of the advantages of working on the book in parts is that I'll have a chance to get reader feedback while I'm still writing. This will allow me to address questions raised by readers in these last chapters as well.

Reading this book won't keep you from getting RSI, or cure you if you have it. The patterns of behavior that this book addresses are deeply ingrained habits, and can't be changed overnight. They *can* be changed, though, and reading this book should show you how to embark on the path to change, if you choose to do so.

Low-Stress Computing

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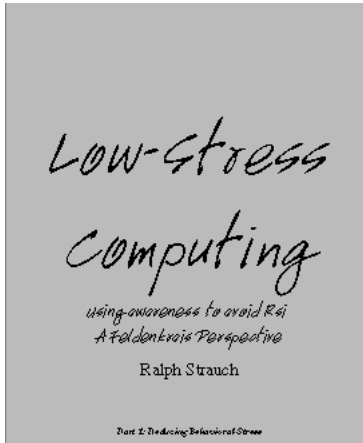
About the Author

Ralph Strauch, Ph.D. , has a private practice in the *Feldenkrais Method* in Pacific Palisades, California, and teaches workshops in various aspects of awareness and movement throughout the United States. He was trained by the founder of the *Method*, Dr. Moshe Feldenkrais, and has been exploring the body/mind interaction through T'ai Chi and related practices since the late 1960s.

Ralph brings to his practice a wide-ranging background and experience. He received his Ph.D. in Statistics from the University of California, and was formerly a Senior Mathematician with the Rand Corporation, where his research focused on issues of human and organizational decisionmaking.

Ralph has worked with and around computers since the 1950s, and has been a personal computer user since he got his first Apple II in 1979.

He is the author of *THE REALITY ILLUSION: How you make the world you experience*, and numerous articles on the role of awareness in being human.



Low-Stress Computing

**Using awareness
to avoid RSI:**

A *Feldenkrais* Perspective

**Part 1: Reducing Behavioral
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82 pages, 7x8.5, illus, \$11.95

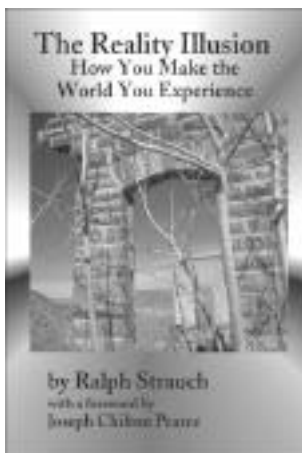
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Explores sources of internal stress and tension which contribute to repetitive stress injury (RSI), and outlines a process of *somatic exploration* to enhance self-awareness and increase ease and efficiency of movement. The discussion should be of value to anyone interested in awareness and fluid movement.

Later chapters (to be published in coming months) will provide more detailed movement lessons covering somatic themes related to RSI.

Chapter Titles

- 1 Introduction
- 2 Excessive effort
- 3 Poor body organization
- 4 Lack of self-awareness
- 5 Synergies between sources of stress
- 6 Reducing Behavioral Stress
- 7 The process of somatic exploration



The Reality Illusion

How you make the world you experience
By Ralph Strauch,

ISBN 0-9676009-3-6 \$15.95
224 pages, 6x9, biblio, illus, index
Published by Somatic Options

This book deals with the nature of perception and the mechanisms we use to create and maintain the collective illusion we call reality. It doesn't directly address the problem of RSI, though it does discuss the some of the mechanisms by which we make the unconscious choices that ultimate lead to trauma and pain in many forms.

What other writers say about *The Reality Illusion*:

"... a tool for bringing mind, brain, and body into alignment, that we might be at peace with ourselves and so with others...personal rewards are endless."

Joseph Chilton Pearce, author of *Crack in the Cosmic Egg*

"...unusually clear, accessible account of the mysteries of the multidimensional world."

Marilyn Ferguson, author of *The Aquarian Conspiracy*

"A powerful learning tool...a clear guide for taking an important step towards an enlarged way of perceiving our lives."

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"...takes you to the boundaries of your own mind and occasionally makes you gasp with wonder at glimpses of what lies beyond"

Serge King, author of *Kahuna Healing*

"An important contribution to brain/mind and how reality is viewed."

Joan Halifax, author of *Shamanic Voices*

Awareness Through Movement audiotapes
by Ralph Strauch

The following tapes are currently available.

- | Tape# | Lessons |
|-------|--|
| 610 | <i>Sensing the Head in Space & Varying the Alignment of the Torso</i> — Enhance awareness of your position and movement in space, and discover the surprising sensory consequences of minor variations from your habitual posture. |
| 611 | <i>Feeling your Cerebral Spinal Pulse & Making Waves</i> — Get in touch with deep pleasurable waves of motion that are always present in your body, and the altered states of consciousness they allow. |
| 613 | <i>Softening the Mouth & Movements of the Jaw</i> — Release tensions you habitually hold in your mouth and jaw. |
| 614 | <i>Supine Pelvic Clock & Freeing the Hips and Pelvis</i> — Increase the mobility of your hips and pelvis, and improve the connections from your pelvis through your spine to your head. |
| 617 | <i>Softening the Ribcage & Breathing throughout the Chest</i> — Enhance the mobility of your ribcage and shoulder girdle, and explore the inside of your torso with your breath. |
| 619 | <i>Spinal Flexion & Spinal Extension</i> — Enhance the mobility of your torso by working with the primary movements of spinal flexion (bending) and extension (straightening). |
| 623 | <i>Reaching with the Whole Body & Connecting the Fingers to the Spine</i> — Release the tensions that fragment your movements of reaching/touching/manipulating things, and reexperience the unity of movement that is your birthright. |

These tapes were recorded during live classes and workshops. They were not intended to deal with RSI, *per se*, but were part of ongoing exploration in self-awareness and movement. Nonetheless, they can be useful for people experiencing the effects of RSI. The descriptions below should help you decide which tapes might be of value to you.

RSI often involves pain in the hands and wrists. This is due in part to excessive tension in the hands and arms, and to a fragmentation of movement while typing (trying to type in just the hands, while holding the torso, shoulders, and arms rigid). **Tape 623 (Reaching with the Whole Body & Connecting the Fingers to the Spine)** contains two lessons which relax and integrate the arms and hands, and is probably most relevant single tape available here for someone suffering from RSI.

As you type your arms should be supported by relaxed shoulders and a relaxed torso, itself supported by a relaxed spine. Excessive tension and rigidity in your spine and upper torso restricts the flow of movement as you work, imposing mechanical strains that lead to RSI. **Tapes 617 (Softening the Ribcage & Breathing throughout the Chest)** and **619 (Spinal Flexion & Spinal Extension)** put you more in touch with how you use your torso, and in the process help you reduce that rigidity.

When you feel grounded and supported by the surface beneath you, your upper body can relax and center itself over the base that your lower body provides. When you don't feel supported from below, you tense your upper body in an attempt to make up for that lack of support. **Tape 614 (Supine Pelvic Clock & Freeing the Hips and Pelvis)** can increase your awareness of your pelvis, and of the skeletal path of support from your pelvis up your spine to your head.

Excessive tension in the mouth and jaw both results from and produces tension throughout the spine and upper torso. If you experience your jaw as tense and rigid, you may find **Tape 613 (Softening the Mouth & Movements of the Jaw)** useful.

The lessons on **Tape 610 (Sensing the Head in Space & Varying the Alignment of the Torso)** both deal primarily with increased self-awareness. Sensing the Head in Space gives you a heightened awareness of the balance, position, and movement of your head in space, while Varying the Alignment of the Torso allows you to experience the often significant changes in subjective experience brought about by small changes in the organization of your torso.

The lessons on **Tape 611 (Feeling your Cerebral Spinal Pulse & Making Waves)** are intended to take you within yourself and provide a deeply centering and integrative experience.

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