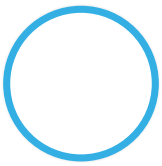
21. Somaesthetics

By Richard Shusterman

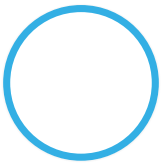
What is somaesthetics and why should it appear as a core article in an encyclopedia devoted to Human-Computer Interaction and Interaction Design? Readers trained in design studies and informational technology should not feel guilty if the term strikes them as unfamiliar and even difficult to decipher or pronounce. As a new interdisciplinary field whose roots are in philosophical theory, somaesthetics offers an integrative conceptual framework and a menu of methodologies not only for better understanding our somatic experience, but also for improving the quality of our bodily perception, performance, and presentation. Such heightened somatic awareness and mastery offers benefits to many fields including design. Our experience of ourselves and our world is always embodied and involves somatic responses and feelings that are typically unnoticed though they are unavoidable and indispensable for our proficient functioning. We need a proper feel for our tools in order to use them most effectively; and this includes the use of one's own body in using other tools. For the body is our indispensable tool of tools, the necessary medium of our being, perception, action and self-presentation in the world. By

exploring the fundamental features of our embodied ways of engaging the world and transforming it through action and construction, somaesthetics can provide useful insights and experiential skills to help designers produce products and situations that provide more rewarding and pleasurable experience.

21.1 Introductory Videos



Somaesthetics Video 1: Introduction to Somaesthetics 1



Somaesthetics Video 2: Ancient Culture

Somaesthetics Video 3: Linking Theory with Practice

Somaesthetics Video 4: Designing Interactive Products

Somaesthetics Video 5: Maximize Business Value by Applying Somaesthetics

Though somaesthetics is grounded in philosophical theory and therefore does not command the wide media attention and advertising hype that technological inventions often receive, it is not a narrowly abstract discipline that advocates pure theory over practice and concrete applications. Nor does it hide behind abstruse technical jargon. It emerges from American pragmatist philosophy that insists on the primacy of practice even in the constructing and testing of theories and that equally insists on clear language, empirical evidence, and practical results. Somaesthetics reflects the pragmatist idea of philosophy as a means of improving experience through a reflective art of living. Philosophy, in this sense, is a tool for designing life.

Somaesthetics is an interdisciplinary research project devoted to the critical study and meliorative cultivation of the experience and use of the living body (or soma) as a site of sensory appreciation (aesthesis) and creative self-stylization. An ameliorative discipline of both theory and practice, somaesthetics seeks to enrich not only our discursive knowledge of the body but also our lived somatic experience and performance; it aims to improve the meaning, understanding, efficacy, and beauty of our movements and of the environments to which our actions contribute and from which they also derive their energies and significance. To pursue these aims, somaesthetics is concerned with a wide diversity of knowledge forms, discourses, social practices and institutions, cultural traditions and values, and bodily disciplines that structure (or could improve) such somatic understanding and cultivation, and it is therefore an interdisciplinary project, in which theory and practice are closely connected and reciprocally nourish each other. It is not limited to one theoretical field, academic or professional vocabulary, cultural ideology, or particular set of bodily disciplines. Rather it aims to provide an overarching theoretical structure and a set of basic and versatile conceptual tools to enable a more fruitful interaction and integration of the very diverse forms of somatic knowledge currently being practiced and pursued. There is an impressive, even overwhelming abundance of discourse about the body in many disciplines of contemporary theory and commercial enterprise. But such somatic discourse typically lacks two important features. First, a structuring overview or architectonic that could integrate their very different discourses into a more productively coherent or interrelated field. It would be useful to have a broad framework (which does not mean a unified, highly consistent system) that could connect, for example, the discourse of biopolitics to the therapies of bioenergetics, the neuroscience

of hand gestures to their aesthetic meaning in Nõ theater. The second feature lacking in most academic discourse on embodiment is a clear pragmatic orientation — something that the individual can clearly employ or apply to his or her life in terms of disciplines of improved somatic practice. Somaesthetics offers a way to address both these deficiencies.

21.2 Genealogy and Emergence

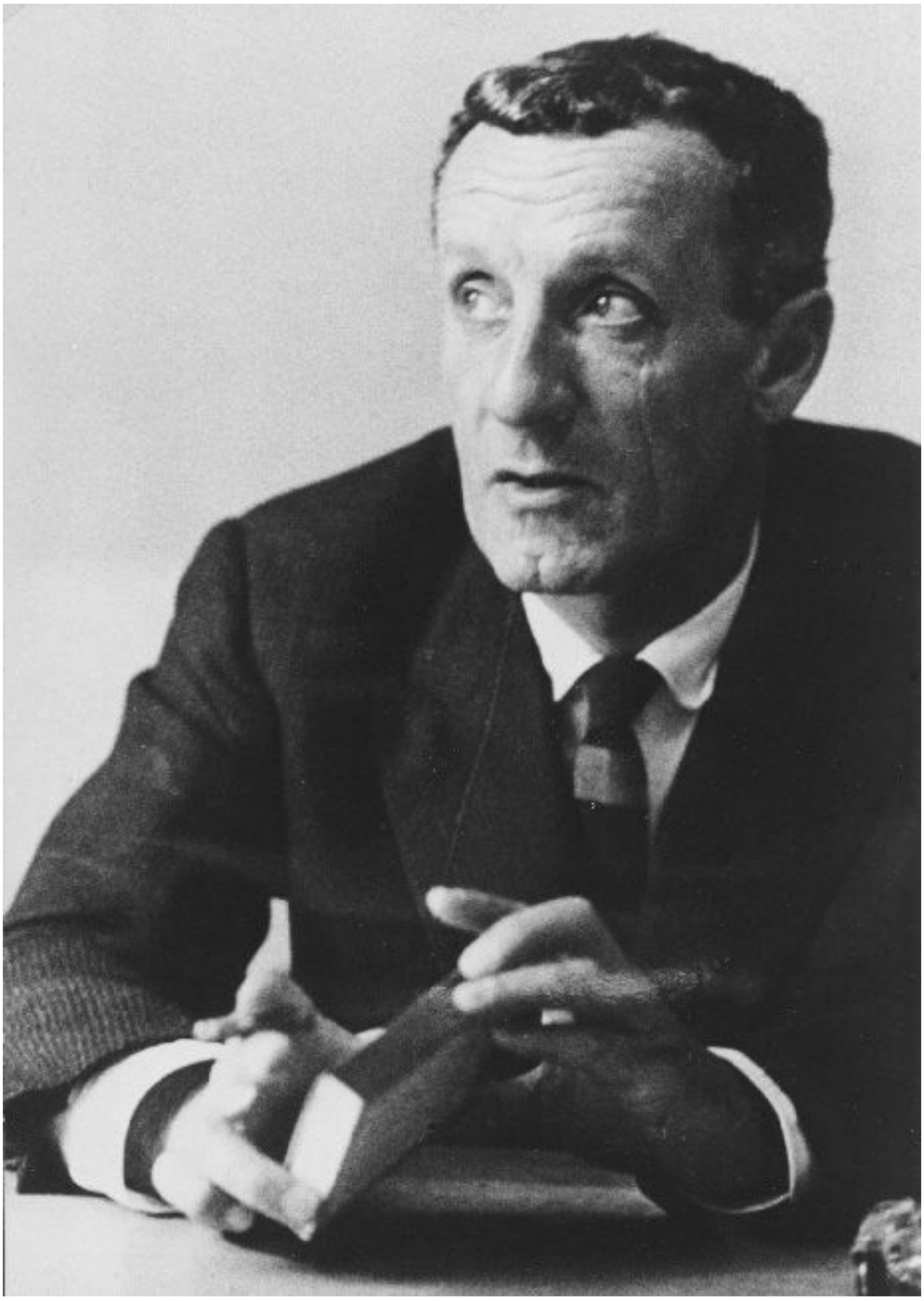


Figure 21.1: The French philosopher Maurice Merleau-Ponty (1908-1961) who affirmed the body as the centre of human cognition

The research project of somaesthetics delineated above began to emerge in the mid-1990s from two principal themes in my research: pragmatist aesthetics and philosophy as an embodied art of living. If pragmatist aesthetics rejects the traditional aesthetic attitude of distanced, disinterested contemplation by advocating an aesthetics of active, creative engagement, then it also should recognize that all action (artistic, practical, or political) requires the body, our tool of tools. Building on the pragmatist insistence on the body's central role in artistic creation and appreciation, somaesthetics highlights and explores the soma — the living, sentient, purposive body — as the indispensable medium for all perception. If experiences of art and beauty are distinctive for the powerfully gratifying ways they absorb our attention, unify our consciousness, and engage our emotions, then increasing our powers of awareness, focus, and feeling through better mastery of their somatic source could render more of our experience similarly rewarding in such ways. Not only art's creation and appreciation would be enhanced through this heightening of consciousness, but also the attractive shaping of our lives as an art of living could be enriched by greater perceptual awareness of aesthetic meanings, feelings, and potentials in our everyday conduct of life.

Figure 21.2: Confucius (551-479 BC), the Chinese philosopher, who advocated cultivation and refinement of the body, particularly through art and ritual.

This ancient pragmatic idea of philosophy as a way of life or art of living is thus a second root of the somaesthetic project, with its integration of theory and practice. Embodiment has become an increasingly trendy theme in academia but somaesthetics takes the notion of embodied philosophy in a distinctively strong sense, even stronger than that of phenomenologies like Merleau-Ponty's in which the body forms a central perspective that structures the philosophical system and is celebrated as a sentient, intelligent, purposive, skilled subjectivity that likewise helps

construct the world rather than being a mere physical object in it. Rather than the phenomenological quest to reveal an alleged primordial, foundational, and universal embodied consciousness that (in Merleau-Ponty's words) is "unchanging, given once and for all," and "known by all men" in all cultures and times, somaesthetics (as I conceive it) recognizes that somatic consciousness is always shaped by culture and thus admits of different forms with different cultures (or with different subject positions within the same culture) (footnote 1). Second (and more important than , somaesthetics is interested not merely in describing our culturally shaped forms of somatic consciousness and modes of somatic practice but also in improving them. Third, to effect such improvements, it also includes practical exercises of somatic training rather than mere philosophical discourse (footnote 2).

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Building on pragmatic insights and ancient philosophical traditions from both the East and the West, somaesthetics advocates somatic training as a worthy dimension of philosophical cultivation and expression. Confucius clearly affirmed somatic cultivation as a crucial dimension of philosophical

education, once informing his disciples that he could cease speaking and simply teach as nature does by embodying his philosophy in his bodily behavior. Daoism also advocated somatic cultivation, though sometimes in very different modalities. For more detailed discussions of Confucian and Daoist views relating to issues in somaesthetics, see Shusterman (2009). Greek and Roman thinkers often likewise advocated this ideal, sometimes by contrasting true philosophers who lived their philosophy to those who merely wrote philosophy and thus were denigrated as mere "grammarians." (footnote 3) Invoking this ancient tradition, I thus described somaesthetics "as a new name for some old ways of thinking," borrowing the shrewd formulation William James used to subtitle his first book on pragmatism. I used the term "soma" (a less familiar expression deriving from the Greek word for body) to avoid problematic associations of body (which can be a lifeless, mindless thing) and flesh (which designates only the fleshly parts of the body and is strongly associated with Christian notions of sin) and to insist that my project concerns the lived, sentient, purposive body rather than merely a physical body. The "aesthetic" in somaesthetics also originates in Greek, deriving from the word for sensory perception (*aisthesis*) that Alexander Baumgarten used to coin the modern philosophical discipline of aesthetics in 1758. So "somaesthetics" (a simple splicing of "soma" and "aesthetics") implies a project of appreciating and cultivating the body not only as an object that externally displays beauty, sublimity, grace, and other aesthetic qualities, but also as a subjectivity that perceives these qualities and that experiences attendant aesthetic pleasures somatically. When Baumgarten founded aesthetics, he intended it as a general science of sensory cognition rather than a field exclusively devoted to art and objects of beauty. But though his theory was focused on the senses, he excluded all considerations of the

bodily dimension of sensation, believing that sensory perception was an entirely mental affair. Somaesthetics thus returns aesthetics to its roots as a science of sensory perception but insists on the somatic dimension of such perception and of our action, thought, and feeling as well.

From the outset, somaesthetics has had an international career. I first introduced it in a 1996 book in German, *Vor der Interpretation*, using the term "Somästhetik" to designate this project, before its initial English presentation in *Practicing Philosophy: Pragmatism and the Philosophical Life* (1996), and then the first detailed articulation of its structure in "Somaesthetics: A Disciplinary Proposal" (1999, reprinted in *Pragmatist Aesthetics*, 2nd edition, 2000). *Performing Live* (2000) represents a further stage in the development of somaesthetics in which its connection with the new media is discussed and different methodologies for heightening body consciousness are analyzed, while *Body Consciousness* (2008) constitutes my most comprehensive treatment of somaesthetics, though it focuses primarily on the experiential dimension of the somaesthetic field, whose general structure is outlined in the section 3 of this article.

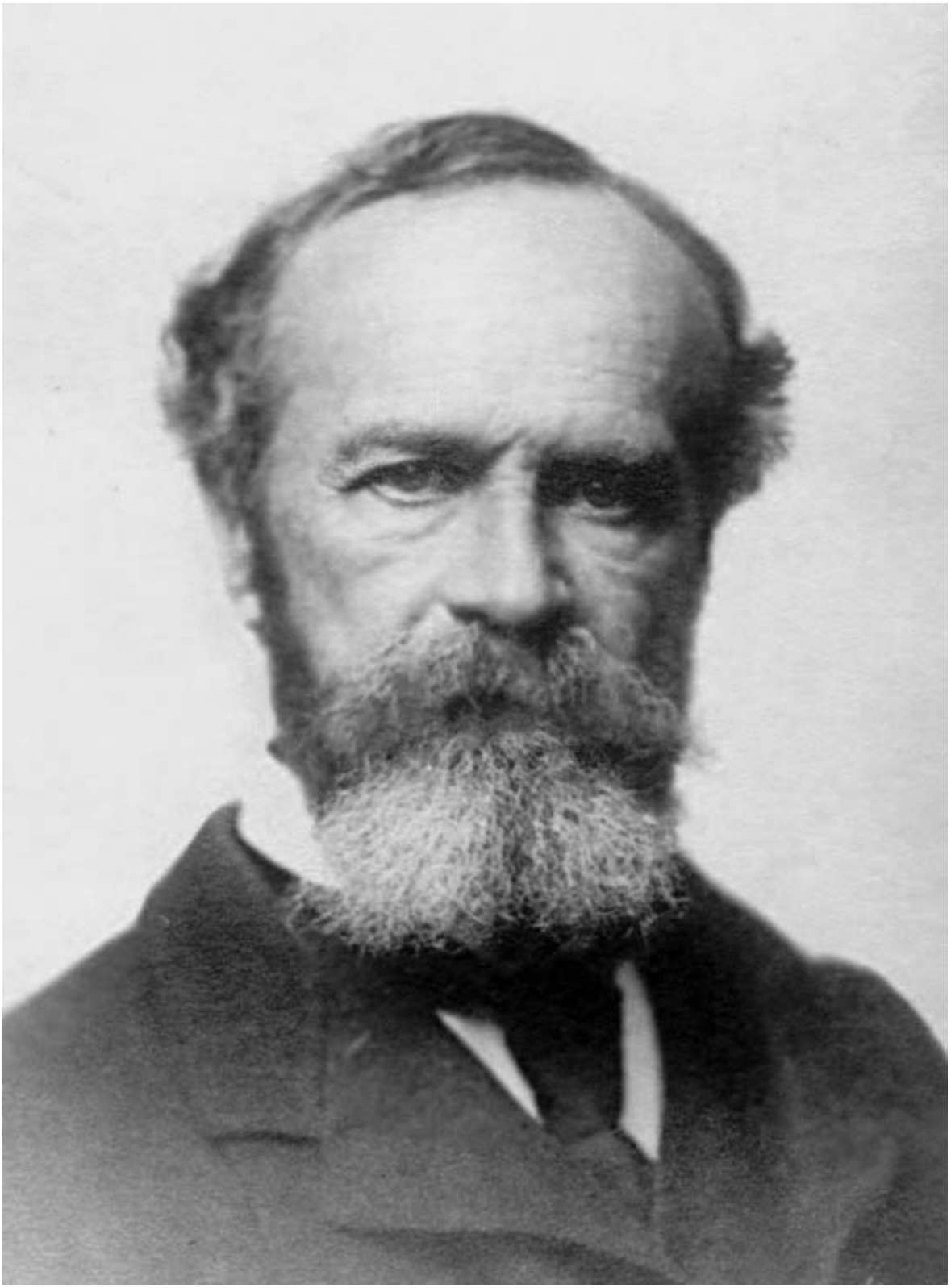

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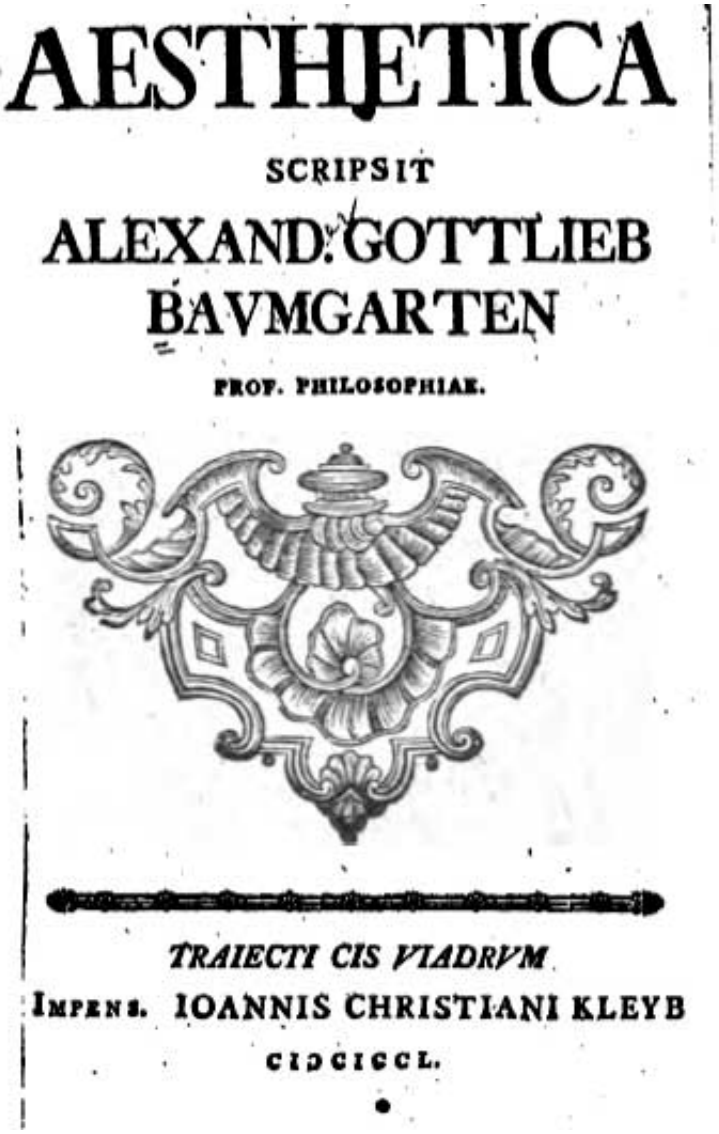
Figure 21.3.A: The American psychologist and philosopher William James

(1842-1910), whose pragmatist philosophy has inspired somaesthetics and its insistence on the interaction between theory and practice.


AESTHETICA

SCRIPSIT

ALEXAND. GOTTLIEB BAVMGARTEN

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TRAIECTI CIS VIADRVM

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Figure 21.3.B: In his book Aesthetica from 1750, the German philosopher Alexander Gottlieb Baumgarten (1714-1762) coined the philosophical discipline of aesthetics that rehabilitates the cognitive powers of the senses.

21.3 Somaesthetics as an Interdisciplinary Field

Figure 21.4: Somaesthetics as performance art and photography: From the Soma Flux series, photographed by Yann Toma at Cartagena, Colombia

Initially I thought of the somaesthetic project as being fully nested within the discipline of philosophy, perhaps as a branch of aesthetics. But I soon realized that somaesthetics should be an essentially interdisciplinary field,

even if grounded in philosophy. As all human perception and action goes through the soma, many different academic disciplines can contribute significantly to the study and improvement of somatic experience and performance. It would be foolish, therefore, to limit somaesthetics to the methods and concerns of philosophy. Engaging a wide variety of knowledge forms and disciplines that structure our somatic experience or can improve it, somaesthetics is a framework to promote and integrate the diverse range of theorizing, empirical research, and melioriative practical disciplines concerned with bodily perception, performance, and presentation. While originally rooted in my philosophical research, it is not a single theory or method advanced by a particular philosopher but an open field for collaborative, interdisciplinary, and transcultural inquiry. Its applications already extend beyond philosophy to a broad array of topics ranging from the arts, product design, and politics to fashion, health, sports, martial arts, and the use of hallucinogenic drugs in education (footnote 4). Somaesthetics' most notable developments thus far can be grouped into three general areas: arts, politics, and design of technology.

Figure 21.5: Somaesthetics as performance art and photography: From Yann Toma's Soma Flux series at Cartagena, Colombia

Though dance may be the most paradigmatic of somatic arts, somaesthetics has been equally applied to theatre in analyzing the somatic styles of movement and posture of actors on stage (footnote 5).

Somaesthetic concepts and theories have been even more extensively deployed for understanding music and music education (footnote 6). In visual arts, somaesthetics has been used to explain not only how artists use their bodies in making artworks but also how observers deploy themselves somatically to perceive such works. Many works of visual art (whether paintings, sculptures, photographs, or installations) consciously presuppose and play with the viewers' somatic standpoint, so that the soma can be powerfully thematized in a work without a body being visually represented in it (footnote 7). The body (with its multiple senses and movement through space) likewise plays a formative role in architectural design and experience. Performance art presents a distinctive case in which the body is not only a tool of creation and means of perception but also the expressive medium and visual end-product or art object. Building on my somaesthetic theory, Martin Jay shows the political import of body-centered performance works that challenge the prevailing norms of bodily form and comportment with their attendant sociopolitical hierarchies of domination (footnote 8).

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Somaesthetics has begun to have an impact not only on the analysis of visual art, but also on its practice. One prominent example is its use as a generative theoretical background for Peng Feng's curatorial project for the Chinese Pavilion of the 2011 Venice Biennale. Entitled *Pervasion*, this

show of five installation pieces (including clouds with tea fragrance; pipes dripping with Chinese schnapps; fragrant porcelain pots of herb medicine; fog of incense; and lotus-scented virtual snow) sought to emphasize that our appreciation of even visual art is always much more than visual and to highlight the soma's role as transmodal perceiving subjectivity by engaging also the pleasures of other bodily senses (footnote 9). Somaesthetics has also been used as a creative framework for a series of photographic and cinematic works that the Parisian artist Yann Toma has realized in close collaboration with me (footnote 10).

Figure 21.6: Picture from the Chinese Pavilion of the 2011 Venice Biennale

Figure 21.7: Picture from the Chinese Pavilion of the 2011 Venice Biennale

Figure 21.8: Picture from the Chinese Pavilion of the 2011 Venice Biennale

Figure 21.9: Picture from the Chinese Pavilion of the 2011 Venice Biennale

Figure 21.10: Picture from the Chinese Pavilion of the 2011 Venice Biennale

Among political applications of somaesthetics, feminist interventions loom large. This should not be surprising since women are traditionally identified with body and thus negatively contrasted with what our culture deems to be the superior male principle of mind. As Shannon Sullivan uses somaesthetic ideas to critique the devalorization of bodily practices associated with women and to insist (through notions of somaesthetic teaching, caring, and dialogue) that working on the body is not a merely selfish, unsocial project, so Cressida Heyes deploys somaesthetics as a model enabling "political resistance to corporeal normalization" that subjugates women and men. Since race, like gender, is perceived through somatic appearance, racism provides another political issue in which somaesthetic strategies have been proposed both as explanations and as therapeutic remedies (footnote 11).

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For me, the most surprising extension of somaesthetics has been in the arena of high-tech design, particularly with new information technologies. I did not expect this because the somaesthetic project was initially inspired by ancient ideas of the embodied philosophical life and by traditional Asian

somatic practices such as yoga and *zazen* or contemporary Western counterparts (such as Alexander Technique or Feldenkrais Method) that preserve a similar organic character by not treating the body with electronic appliances. Although my work addressed the new media's challenge to embodiment, I did so mainly by arguing two major points: First, no technological invention of virtual reality will negate the body's centrality as the focus of affective, perceptual experience through which we experience and engage the world. Second, that cultivating better skills of body consciousness can provide us with enhanced powers of concentration to help us overcome problems of distraction and stress caused by the new media's superabundance of information and stimulation. But I made no effort to envisage positive ways that our newest technologies might reshape somatic experience. How, for example, could future developments in genetic engineering, nanotechnology, robotics, and experimental drugs yield significant changes in our somatic powers either by changing the bodies which nature gives us or complementing them with prosthetic or chemical enhancements that dramatically augment the soma's perceptual, cognitive, and motor capabilities? How should somaesthetics prepare to deal with these changes and their corresponding new capacities for somatic self-cultivation, self-stylization, and social interaction?

Philosopher Jerrold Abrams has helped remedy this omission by exploring, in a speculative way, issues in what some might call posthuman somaesthetics because these issues involve significant alterations or enhancements to the traditional biological human soma (footnote 12). Of course, the human soma is already a product of considerable evolution, and it seems plastic enough to absorb significant change and prosthetic

devices without condemning us to being posthuman cyborgs. That we can sometimes be considered human cyborgs by having manufactured enhancements incorporated into our embodied selves (contact lenses, pace makers, false eyelashes, wigs…) seems more or less evident. Questions such as the possible limits of the human soma and whether or how should we should speak of nonhuman somas are interesting topics for somaesthetic analysis that I cannot properly address in this article. They depend not simply on the future of technology but also on the evolution of our conceptual schemes concerning the human and concerning the notion of soma (footnote 13). But putting aside futuristic speculations, I will discuss some recent work relating somaesthetics to human-computer interaction research after the following section on the structure of somaesthetics

21.4 Structure of Somaesthetics

Somaesthetics, as I conceive it, consists of three branches that sometimes overlap to some extent.

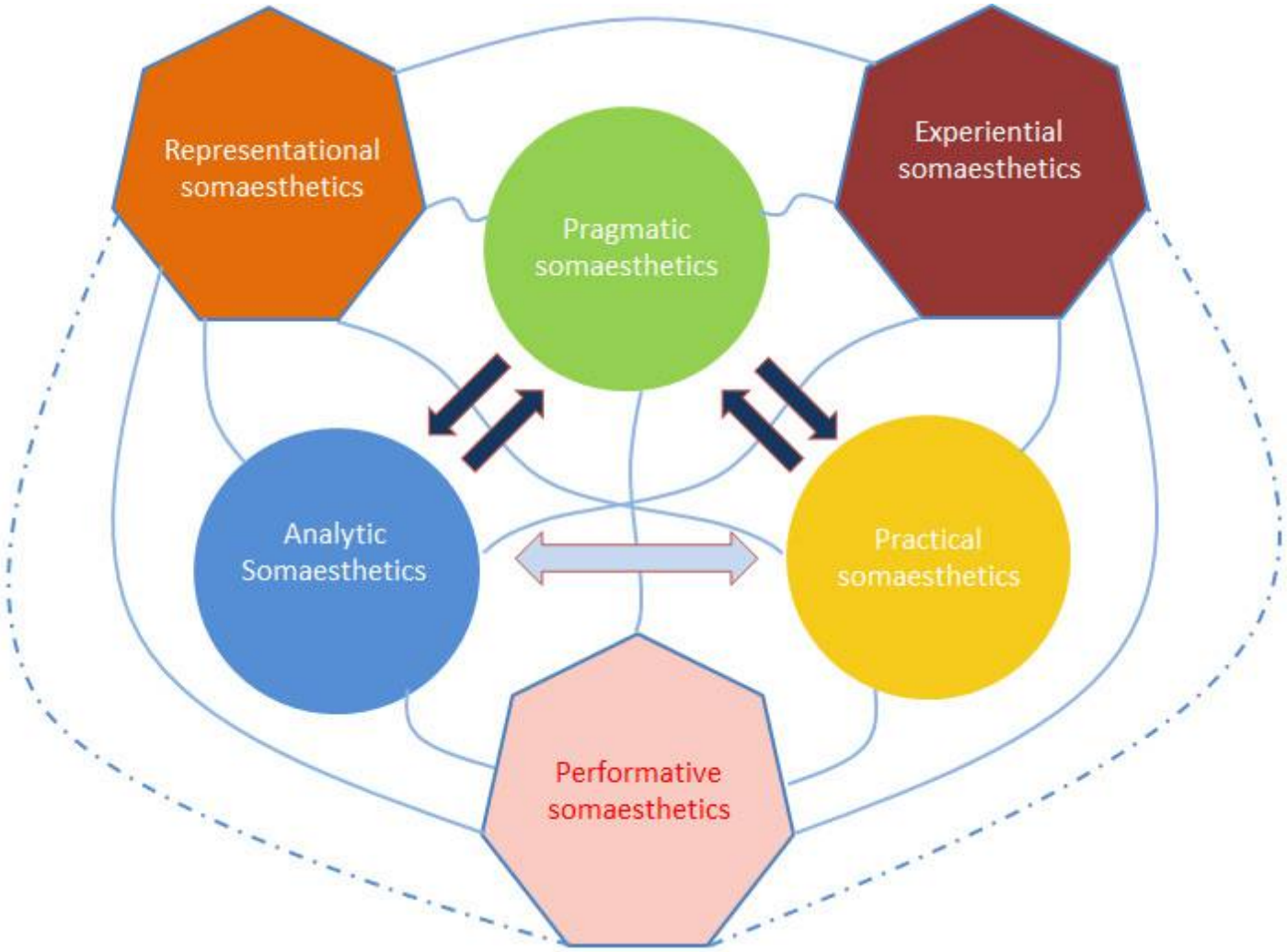

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Figure 21.11: Diagram of the different branches and dimensions of somaesthetics and of their interrelations, designed by Richard Shusterman and Hyijin Lee

21.4.1 Analytic Somaesthetics

The first, *analytic somaesthetics*, is an essentially descriptive and theoretical enterprise devoted to explaining the nature of our bodily perceptions and practices and their function in our knowledge and construction of the world. Besides the traditional topics in philosophy of

mind, ontology, and epistemology that relate to the mind-body issue and the role of somatic factors in consciousness and action, analytic somaesthetics also includes the sort of genealogical, sociological, and cultural analyses of embodiment, including the body's role in sustaining social and political power. Such studies, most famously advanced by Simone de Beauvoir, Michel Foucault, and Pierre Bourdieu, show how the body is both shaped by power and employed as an instrument to maintain it — how bodily norms of health, skill, and beauty, and even our categories of sex and gender, are constructed to reflect and sustain social forces.

21.4.2 Pragmatic Somaesthetics

In contrast to analytic somaesthetics, whose logic is essentially descriptive, *pragmatic somaesthetics* has a distinctly normative, often prescriptive, character because it involves proposing specific methods of somatic improvement or engaging in their comparison, explanation, and critique. Since the viability of any proposed method will depend on certain facts about the body (whether ontological, physiological, or social), this pragmatic dimension presupposes the analytic dimension. However, it transcends analysis not only by evaluating the facts analysis describes but also by proposing methods to improve certain facts by remaking the body and the environing social habits and frameworks that shape it. A vast and complex array of pragmatic disciplines has been designed to improve our experience and use of our bodies: various diets, forms of grooming and decoration, martial and erotic arts, yoga, massage, aerobics, bodybuilding, calisthenics, and modern psychosomatic disciplines such as the Alexander Technique and the Feldenkrais Method.

These different methodologies of practices can be classified in different

ways. We can distinguish between practices that are holistic or more atomistic. While the latter focus on individual body parts or surfaces — styling the hair, painting the nails, shortening the nose or enlarging the breasts through surgery — the former practices are emphatically oriented toward the whole body, indeed the entire person, as an integrated whole. Hatha yoga, t'ai chi ch'uan and Feldenkrais Method, for example, comprise systems of integrated somatic postures and movements to develop the harmonious functioning and energy of the body as a unified whole. Penetrating beneath skin surfaces and muscle fiber to realign our bones and better organize the neural pathways through which we move, feel, and think, these practices insist that improved somatic harmony is both a contributory instrument and a beneficial by-product of heightened mental awareness and psychic balance. Such disciplines refuse to divide body from mind in seeking the enlightened betterment of the soma (or body-mind) of the whole person.

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Somatic practices can also be classified in terms of being directed primarily at the individual practitioner herself, or instead primarily at others. A massage therapist or a surgeon standardly works on others, but in doing t'ai chi ch'uan or bodybuilding, one is working more on one's own body.

The distinction between self-directed and other-directed somatic practices cannot be rigidly exclusive since many practices are both. Applying cosmetic makeup is frequently done to oneself and to others; and erotic arts display a simultaneous interest in both one's own experiential pleasures and one's partner's by maneuvering the bodies of both self and other. Moreover, just as self-directed disciplines (like dieting or bodybuilding) often seem motivated by a desire to please others, so other-directed practices like massage may have their own self-oriented pleasures.

Despite these complexities (which stem in part from the deep interdependence of self and other), the distinction between self-directed and other-directed body disciplines is useful for resisting the common presumption that to focus on the body implies a retreat from the social. That presumption is surely wrong because not only is the body shaped by the social; it also contributes to the social. We can share our bodies and bodily pleasures as much as we share our minds, and they can be as public as our thoughts. Our bodies are visible social markers of our values, affiliations, and tastes. Somatic self-stylization generates an enormous commercial market that feeds the cosmetic, fashion, dieting, exercise, and plastic surgery industries, along with the advertising industry that supports them by stimulating our desire to stylize ourselves somatically. This desire typically takes the paradoxical form of wanting to fit in yet also stand out as distinctive. In other words, self-styling involves conforming in some way to the norms of some social taste group (even if it be a subculture that resists mainstream taste) yet not allowing such conformity to group style to preclude one's own individual expression (footnote 14).

Moreover, it is crucial to remember that caring for one's own body is

essential to caring properly for others, since all helpful action requires bodily means. That is why the Confucian commandment to respect and care for one's parents carries with it the command to preserve one's own bodily welfare. My professional work as a Feldenkrais practitioner has taught me how important it is to pay careful attention to one's own somatic state in order to pay proper attention to one's client. When I give a Feldenkrais lesson of Functional Integration, I have to be aware of my own body positioning and breathing, the tension in my hands and other body parts, and the quality of contact my feet have with the floor in order to be in the best condition to gauge correctly the client's body tension, muscle tonus, and ease of movement (footnote 15). I need to make myself somatically comfortable so as not to be distracted by my own body tensions and in order to communicate the right message to the client. Otherwise, I will be passing my feelings of somatic tension and unease to the client when I touch him. And since one often fails to realize when and why one is in a mild state of somatic discomfort, part of the Feldenkrais training is devoted to teaching one how to discern such states and distinguish their causes.

Figure 21.12: A somaesthetics body-scan lesson taught by Richard Shusterman, photographed by Hyijin Lee

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Figure 21.13 A-B: A Feldenkrais movement posture; a somaesthetics workshop lecture photographed by Hyijin Lee

Clearer awareness of one's somatic reactions can also improve one's behavior toward others in much wider social and political contexts. Much ethnic and racial hostility is not the product of logical thought but of deep prejudices that are somatically marked in terms of vague uncomfortable feelings and are thus engrained beneath the level of explicit consciousness. Such prejudices and feelings thus resist correction by mere discursive arguments for tolerance, which can be accepted on the rational level without changing the visceral grip of the prejudice. We often deny that we

have such prejudices because we do not realize that we feel them, and the first step in controlling or expunging them is to develop the somatic awareness to recognize them in ourselves (footnote 16).

Somatic disciplines can further be classified as to whether their major orientation is toward external appearance or inner experience. Representational somaesthetics (such as cosmetics) is concerned more with the body's surface forms, while experiential disciplines (such as yoga) aim more at making us feel better in both senses of that ambiguous phrase: to make the quality of our somatic experience more satisfying and also to make it more acutely perceptive. The distinction between representational and experiential somaesthetics is one of dominant tendency rather than a rigid dichotomy. Most somatic practices have both representational and experiential dimensions (and rewards), because there is a basic complementarity of representation and experience, outer and inner. How we look influences how we feel, and vice versa. Practices such as dieting or bodybuilding that are initially pursued for representational ends often produce inner feelings that are then sought for their own experiential sake. Just as somatic disciplines of inner experience often use representational cues (such as focusing one's attention on a body part or using imaginative visualizations), so representational disciplines such as bodybuilding use experiential clues to serve their ends of external form, helping to distinguish, for example, the kind of pain that builds muscle from the pain that indicates injury.

A third category of pragmatic somaesthetics could be distinguished for disciplines that focus primarily on building strength, health, or skill and that would include practices such as weightlifting, athletics, and martial arts. This category could be called "performative somaesthetics." But to

the extent that these disciplines aim either at the external exhibition of performance or at one's inner feeling of power and skill, they might be associated with or assimilated into the representational or experiential categories.

21.4.3 Practical Somaesthetics

The different methodologies of pragmatic somaesthetics need also to be distinguished from actual somatic practice, which I construe in more robust terms than the mere writing and reading of body-related texts, even those outlining pragmatic methods. Thus, besides analytic and pragmatic branches of somaesthetics, there is a further branch — *practical somaesthetics* —which involves actually engaging in programs of disciplined, reflective, corporeal practice aimed at somatic self-improvement (whether representational, experiential, or performative). This dimension of not just saying but of physically doing seems sadly neglected by contemporary accounts of the body in philosophy and other humanities disciplines, though it has often been crucial to the idea of the philosophical life, and it is essential to the idea of somaesthetics as integrating both theory and practice. I therefore teach workshops on practical somaesthetics to convey this practical dimension in a more embodied way than merely verbal insistence.

Figure 21.14: A video clip extract from a somaesthetics workshop for dancers and choreographers (in French), filmed by Damien Marteau

21.5 Somaesthetics and Human-Computer Interaction

Researchers and practitioners in the field of Human-Computer Interaction have been increasingly engaging with somaesthetics in their work, particularly in the field of HCI design. Though their interest initially surprised me, I should have expected it because the soma is central to everything that we do. Not only does it serve as the basic tool through which we perceive the world and deploy all further tools (including computers) but the soma is also our most intimate example of an interactive system of interdependent (but also to some extent autonomously functioning) interacting subsystems with extensive, complex, subtle, yet amazingly rapid and efficient feedback loops. In plotting how computers interact with human systems, the multifaceted somatic complex system should be at the core. At present somaesthetic-related HCI design research includes both theoretical models and more concrete productions. My discussion will choose an example from each.

One promising theoretical effort (developed by Youn-Kyung Lim and her colleagues) proposes a model that integrates the basic sensory and affective experience of the computer user together with the physical properties of the tools deployed in computer interaction and then explains how these and other factors produce higher, emergent qualities of interactive aesthetic Gestalt that belong to the overall interactive situation or experience (footnote 17). In this model, somaesthetics not only provides recognition that somatic feelings form an important part of user experience in the interaction but it also offers methods to heighten the user's (including the designer's) consciousness of those somatic feelings so their feedback into the interactive Gestalt can be more effective (and, with the designer, more effectively available for improving the design).

At this stage in somaesthetics research, we have only been concerned with somatic feelings of human bodies and thus with only one side of the HCI interaction. But, in principle, it may be possible to consider the somaesthetics of nonhuman somas, including computer bodies. If these are complex, sensitive, and responsive enough in their perceptions and reactions, perhaps we can eventually speak, in some way, of their somatic experience in the interaction. Perhaps we can speak of their own bodily experience of (or physical response to) rough or clumsy handling or smoothly flowing use, even if there is no good way of attributing to these computers human-like conscious feelings. This idea of computer or robotic somaesthetics may seem wildly futuristic, and it seems more promising for now to focus somaesthetic research on human somatic experience. But it would be wrong to preclude in principle that somaesthetics could be developed beyond the human soma to make its contribution to HCI research still richer by dealing with both sorts of bodies — organic and mechanical, particularly since the human soma is increasingly lived through mechanical enhancements, including such traditional ones as eyeglasses and hearing aids.

With respect to the lived integration of human and computer bodies I can bring an intriguing example of a practical application of somaesthetics to HCI research. Thecla Schiphorst "argues for the value of exploring design strategies that employ a somaesthetic approach" not only through theoretical texts but also by fashioning a series of interactive, networked artworks based on sensory interactions involving touch and breathing. Some of these works are "interactive wearable art" in which the garments react not only to the wearer's organic movements and breathing but also to tactile or breathing inputs from other participants interacting through

computer networks, which includes iPhone inputs. Other works are soft computerized bodies that react to human touch (but also to their own movement) by responses of vibration, light, and sound which they can communicate wirelessly (to enlarge the network of interactive response) to other such bodies in the network (footnote 18).

21.6 Practical Applications

The practical applications of somaesthetics are as wide-ranging and diverse as the uses of the soma in our lives, for it is the core medium of all our perception, cognition, and action. Its applications to the arts, to health and fitness, to socio-political issues such as racism, sexism, and ethnic hatred, and to education have been discussed extensively elsewhere (footnote 19). I confine my remarks here to applications in product design, with special attention to HCI. But I believe that the design of any product (chair, cereal box, car, or cell phone) could beneficially employ somaesthetic principles. Somaesthetics is not ergonomics. One problem with ergonomics is its interactive deficiency; it does not really involve the subject's input in a serious way, and certainly not in a continuous way. In contrast, somaesthetic design does involve user input because it is essentially structured on body consciousness, how the user's body actually feels in the relevant actions performed and not simply how it is anatomically structured in general or in the abstract. Somaesthetics works not only with the level of explicit consciousness of bodily feelings but with reflective somatic consciousness, that is with how awareness of the somatic feeling modifies that feeling. In this way, somaesthetics can provide for more effective, richer feedback loops in interaction. Moreover, somaesthetic recognition that our bodily perceptions and feelings are

transmodal can help designers avoid the mistake of not taking into account sensory integration but rather base their interactive design by considering individual senses in isolation and treating them as separate capacities (often to be ranked and hierarchized).

Somaesthetics appreciation of the particularities of individual body consciousness offers a further advantage for interactive design. Interactive products are not necessarily sensitive to individual tendencies so that each person must try to conform to the standards set by designers, which are often arbitrary and based on visual form. Somaesthetics can help design become more effective and pleasurable to the end-user not only by taking into account of bodily feelings appropriate to the product but also personalizing them based on the computation of an individual's preferences, habits, and performances. An example would be a touch screen that automatically calibrates the weight of an individual's touch, so that using the product would feel easier and more agreeable rather than frustrating, because it would be more responsive to the individual user. This greater responsiveness, if developed through changing input, could make the product interaction also more meaningful to the user, providing an input on his or her current state. Another example might be a hand-held object like a cell phone; how does the object feel in the hand. The emphasis on lightness in design can be exaggerated. Sometimes things with a greater weight feel better in the hand and are more effectively held and used.

The reasons for a heavier object feeling better to us can be very complex. They include not only sensory reasons and habitual expectations of certain weights but also psychological associations, for example the association of weight with sturdiness, durability, and thus reliability. The Danish audio-

visual company Bang and Olufsen actually add unnecessary metal to their hand-held remote control products to give their consumers confidence that these products are well-made and sufficiently rugged to endure hard use.

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Figure 21.15: The B&O remote control - heavy seems to mean sturdy

More generally, designers could improve their design skills by becoming more aware of how they use themselves and how they feel when using particular products rather than merely thinking of how the product is conventionally used. A comparative study of how different shapes of cup handles affect one's feelings towards drinking, for example, could be used to improve cup design. Does the handle make your forefinger grip tightly, and how does this affect the rest of your arm, the rest of your body, and by extension, the feeling of drinking?

21.7 Future Directions

Rooted in ancient philosophical ideas and body disciplines that have been reconceptualized through contemporary pragmatist philosophy, somaesthetics is firmly grounded in philosophy, history, and theory, but its future directions, I hope, will be increasingly interdisciplinary and practical. It is a vast and extremely diverse research project that can welcome a wide variety of researchers. The most profitable interdisciplinary engagement I envisage for somaesthetics would not be a mechanical application of somaesthetic principles derived from philosophical speculation and then applied to another field such as health, design, art, and so on. A more rewarding future is for interdisciplinary teams to work together on somaesthetic questions in which experts in somaesthetic theory, disciplines of body consciousness, and other disciplinary fields interested in applying somaesthetic ideas would dialogue and experiment together. It is hard to combat disciplinary inertia

due to the professionalization of knowledge in terms of compartmentalized disciplinary structures and specialties, each with their restricted vocabularies and restricting gatekeepers. One way of tackling that problem is through a practical workshop setting in which theoretical ideas not only can be exemplified and tested in real life somatic actions but can also be refined and new ideas generated through experiential input that is filtered and elaborated through transdisciplinary communication but rooted in a common experiential process structured by the workshop protocol. As disciplines such as HCI show greater interest in somaesthetics, I envisage working with IT and design experts in developing criteria for somatic profiles of use, comfort, ease, and pleasure that could be employed in interactive design. The field of robotics is another HCI area to which somaesthetics could contribute by analyzing how people feel in interacting with other bodies (both human and mechanical) in space. Such studies could teach us what robotic movements (and not simply what robotic shapes) are friendlier for human interaction.

21.8 Where to learn more

Shusterman, Richard (2012): *Thinking through the Body: Essays in Somaesthetics.* Cambridge University Press

In addition, there is a somaesthetics bibliography of the author and a somaesthetics bibliography of other authors.

21.9 References

Shusterman, Richard (2012): *Thinking through the Body: Essays in*

Somaesthetics. Cambridge University Press

Commentary by Jeffrey Bardzell

I begin my commentary by expressing my excitement to see an important philosopher directly engaging the HCI community. Up till now, philosophy's participation in HCI has been mediated by HCI researchers' interpretations and often (frankly) dumbed-down introductions to philosophical concepts. So this is a special moment for us, but it also introduces a practical challenge, and that is that because Shusterman is outside of our community, he can't fully participate in our "language games," which, in the case of HCI refers to the ways we frame and legitimate research, the sorts of questions we ask, the stock of examples we assume everyone knows, the history of the field we all think we hold in common, etc.

For a relationship between somaesthetics and HCI to prosper, linkages will need to be developed. Doing so is a book or at least a lengthy journal article, and I have here only a commentary to work with. So I will pursue the more modest goal of sketching out a position for somaesthetics in HCI, with the hope that others (from HCI, from philosophy) will join those of us who are already exploring those linkages.

My thesis in this commentary is that somaesthetics occupies a unique

theoretical position in our field, able to connect pragmatist approaches to HCI (design theory, experience design) and embodied approaches to HCI (affective computing; mobile, pervasive, and ubiquitous computing). This has implications both for users, and in particular, **norms for serving users in the deepest and most important ways possible**; and also for interaction designers, and in particular, **the cultivation of the professional self as an expert subject**.

My argument will first sketch out recent calls for a more designerly HCI, exploring what those calls really mean, and specifying the challenges this community faces in responding to them; and second it will explore somaesthetics (and related pragmatist traditions) as a collection of useful concepts that has practical, pedagogical, and normative implications for a somaesthetic HCI. I will conclude by reflecting on some limitations of somaesthetics and HCI, which could guide future work.

The rise of design as an input for HCI

As is well documented elsewhere, since the 1990s there have been increasing calls for a more designerly approach to HCI, calls which have picked up steam since 2000. As computing has moved from the workplace and into everyday life, e.g., with the rise of mobile phones, pervasive computing, and the wild spread of digitally enabled consumer electronics, from DVRs to programmable sex toys, the distinctions between product design, service design, communications design, interaction design, and the emerging area of experience design have never been blurrier. Today design is a thriving subcommunity of HCI, with its own official subcommunity within CHI, a highly successful biannual conference in DIS,

and ongoing calls for even more design contributions to the field. For example, McCarthy & Wright (2004) observe that

> “there has been a perceptible shift in nomenclature toward Interaction Design or User Experience Design when referring to relationships between people interactive technologies. This reflects a broadening of focus from computers to a wide range of interactive technologies and from work-related tasks to lived experience.”

-- McCarthy and Wright (2004): p. 3

This turning towards design is often couched in critiques of the limits of social scientific approaches that have dominated HCI for decades. Greenberg & Buxton (2008) write,

> “One way to recast this is to propose that the subjective arguments, opinions, and reflections of experts [e.g., trained designers] should be considered just as legitimate as results derived from our more objective methods.... Another way to recast this is that CHI’s bias towards objective vs. subjective methods means it is stressing scientific contribution at the expense of design and engineering innovations.... The net result is that we eliminate ideas too early, we consider far too few ideas at all, we converge on that which we can measure, which is almost always that which we are already familiar with. Our work degrades into a refinement of the known rather than innovation along new trajectories”

-- Greenberg and Buxton (2008): pp. 114-15

There is a lot going on in this quote, including a critique of an HCI dogma that privileges objective measures over other legitimate forms of design knowledge-making, a prioritization of the social sciences over design and engineering innovation, and above all the practical consequences that we

are too narrow to innovate. Restating this argument more simply, Greenberg and Buxton imply that innovation depends on subjective expertise and is hard to get at using the objective methods valorized by the HCI community.

Kuutti (2009) agrees: tracing the evolution of HCI as an academic-industry collaboration to deal with the explosion in demand for usable software during the rise of the PC in the 1980s, Kuutti describes how *usability* became the primary practical achievement to respond to this problem, with the unfortunate side-effect that "this also meant a certain intellectual impoverishment: calls to discuss about HCI theoretical foundations lost the audience, when the somewhat a-theoretical (and originally sometimes even anti-theoretical) usability movement took over" (Kuutti, 2009, p. 7); indeed this anti-theoretic stance is alive and well today, as can be seen in Tractinsky's account of visual aesthetics in HCI and the portion of my commentary devoted to confronting his anti-theory position.

So the lack of design thinking inhibits innovation, and it is characterized by impoverished theory and a dogmatic fetish for objectivity. What then *is* a designerly approach to HCI? What sorts of theories, methodological strategies, and goals add up to a designerly HCI? A few choice quotes can at least offer some insights:

> "Design education has also not been heavily interested in training students in detailed methods how to do design, but more educating such personalities who can filter and crystallize cultural influences into effective and meaning-laden forms. So the development of personal judgment what is good design what not has always been one of the goals in [design] education. This also means a certain individualism; it is assumed that a design brief interpreted by two designers will lead to two different designs.

-- Kuutti, 2009: p. 3”

Design pedagogy is about “educating such personalities that can filter and crystallize cultural influences into effective and meaning-laden forms.” This characterization is a far cry from the traditional rhetoric of user-centered design. Whereas user-centered design positions the designer in an almost passive position of discovering existing needs using scientific methods and then designing around and for what is discovered in that activity, traditional design activates the designer as a perceptive, insightful, and imaginative meaning-maker, an ability that is individualistic to a certain degree and dependent on judgment rather than data, and offers a radically different view of the foundations of a design problematic.

Cockton offers a more specific account of the sorts of things that designers do as a part of their profession:

> “The gaps [in traditional HCI] include a lack of: ways to track and reflect on design purpose; theoretical receptiveness; underpinning transdisciplinary theory to scope such sensitivities; well thought through approaches for non-work settings; and ways to maintain and compare a diverse range of alternative design means....”
>
> -- Cockton, 2008: p. 2482

This is a different sort of list than one might expect from a traditional textbook on HCI: reflection, theory, a foregrounding of purpose, transdisciplinarity, thoughtfulness, exploration of alternative design means all characterize a designerly approach. Again, the role of a subjective expertise is unmistakeable in this list. It is quite easy to imagine

how one designer could be superior at reflection, use of theory, creativity with alternative means, and so on than another. In contrast, user-centered design methods seem to presume that a designer's strength is the quality of the data informing decisions, not anything internal to the designer herself.

My third quote comes from Greenberg & Buxton again, who offer a different sort of list and yet one that is fundamentally compatible with the vision of design that is emerging here:

> "there are many other appropriate ways [besides usability evaluation] to validate one's work. Examples include a design rationale, a vision of what could be, expected scenarios of use, reflections, case studies, participatory critique, and so on. At a minimum, authors should critique the design.... Early evaluation is usually done through the Design Critique (or 'Crit'). The designer presents the artifact to the group (typically a mix of senior and junior people), and explains why the design unfolded the way it has. Members of the group respond: by articulating what they like and dislike about the idea, by challenging the designer's assumptions through a series of probes and questions, and by offering suggestions of ways to improve the design. This is a reflective and highly interactive process: constructive criticisms and probing demands that designer and criticizers alike develop and share a deep understanding of the design idea and how it interacts within its context of use."
>
> -- Greenberg and Buxton: p. 118-119

Guiding all of this seems to be a holistic *interpretation* of what the design will be, accompanied by a rationale, and vetted by an intensely iterative and ongoing critical process involving stakeholders and other designers. This situates design in a dialogic and argumentative tradition. What is being argued for and against is the designer's *particular framing* of the

problem and *speculative vision* of its solution. Again, the subjective expertise of the designer—as an active meaning-maker and speculative reasoner—is the foundation of the whole activity. Others are brought in on similar terms: their own ability to interpret, frame, re-frame, and speculate determines the quality of critical feedback that they can provide.

In short, design professionals require a cultivated ability to read socio-cultural signs and trends; a creative and reasoned ability to explore alternative futures; a verbal ability to articulate these activities; a receptiveness to alternative framings and a willingness to explore highly variable alternative directions; and above all a personal identity or coherence that holds all of these moving parts together through a given process. Much more is personally demanded of designers than is personally demanded of traditional usability engineers.

So how to we get there?

There are several answers to this question. One is that a small number of individual designers cannot achieve critical mass: we need a design culture in HCI (Nelson & Stolterman, 2003). Creating such a culture has implications both for how interaction designers are trained and also for how the community legitimates certain knowledge practices. But however that happens, one thing is for certain: theory is going to be in the middle of it. Theory has historically been central to design and the humanities, inasmuch as each is concerned with the insightful and imaginative understanding of culture. Inasmuch as HCI now wants such accomplishments to be part of its discipline, HCI will have to get over its aversion to theory and fetish for methods. And this is where a philosophical program such as somaesthetics enters the picture.

Somaesthetics in/for HCI

Shusterman has offered here an accessible introduction to somaesthetics, effectively condensing and synthesizing earlier works, including "Somaesthetics: A Disciplinary Proposal," which appeared as Chapter 10 in the second edition of *Pragmatist Aesthetics: Living Beauty, Rethinking Art* (2000) and his more recent book *Body Consciousness* (2008). I reference these books partly because they much more context for somaesthetics and Shusterman's whole project. The first chapter of *Pragmatist Aesthetics* carefully situates somaesthetics within the context of Dewey's pragmatism and in opposition to analytic aesthetics. This context translates to some core positions.

One core position is a formulation of somaesthetics as comprising **a holistic and even organic perspective on life, work, and the self**. Shusterman's holism is evident in many places, not least in his efforts to undermine rigid distinctions between aesthetics and ethics, as when he writes, "aesthetic considerations are or should be crucial and ultimately perhaps paramount in determining how we choose to lead or shape our lives and how we assess what a good life is" (Shusterman, 2000, p. 237). HCI has long debated about the relative values of function versus aesthetics, with traditional HCI siding with function; but Shusterman follows Dewey in rejecting the distinction and seeing aesthetics as a holistic and inclusive term that encompasses the categories traditionally subsumed under function and form.

Dewey's notion of an aesthetic life is not mere hedonism, but rather a sophisticated understanding of how the human as an organism purposefully and successfully copes with its environment (Berstein, 1971).

Shusterman follows Dewey in rejecting divisions, distinctions, formalisms, and hierarchies. This is not merely an abstract chin-scratching philosophical position, but rather a practical position that has serious methodological implications: it basically rejects atomism or scientific reductionism of experience (Bernstein, 1971). Applied to HCI, such a view would reject the ways that affect researchers decompose affect into mood and emotion, emotion into positive and negative valence, positive valence into *n* number of positive emotions, and each of those into *d* degrees of intensity. Rather, a Deweyan view would construe emotion as a part of human's purposive future-oriented disposition to the world, helping the organism orient itself in the best possible way.

Described holistically, somaesthetics is "**a life-improving cognitive discipline** that extends far beyond questions of beauty and fine arts and **that involves both theory and practical exercise**," which seeks "to end the neglect of the body that [was] disastrously introduced into aesthetics," with the ultimate goal to "contribute significantly to … **an art of living**" (Shusterman, 2000, pp. 266-67). That's a nice sounding agenda, but what does all that mean?

Somaesthetics, like any other philosophical position, can be characterized as comprising a system of relating concepts. I began with the context and overall view, because I don't want an analysis of somaesthetic concepts applied to HCI to lose sight of what somaesthetics is supposed to *do*, which is to help us lead or shape our lives and to recognize what a good life is. I will consider this in two different directions, both of which are central to HCI:

- The training of interaction designers

- Normative criteria for user experience

Aesthetic perception, somatic training, and the interaction designer

In this section I want to argue that two of Shusterman's key concepts, aesthetic perception and somatic training, contribute to both (a) a substantive epistemological account of the designer as expert subject and also (b) a useful set of norms to orient professionals cultivating designerly ways of doing (with implications for interaction design pedagogy as well).

Aesthetic perception

Among the most common views of aesthetic perception in HCI is the stimulus-response model. On this view, an object in the world, such as an interface, acts as a stimulus to the human cognitive system, which responds to it, e.g., by perceiving it, storing it in memory, understanding it, deciding to act based on it, etc. In HCI, for example, physiological data, such as breath rate and skin conductance, is collected as ways of measuring a person's response to an input. Important advances to the field have been made with this model, and I certainly don't want to suggest that it is somehow "wrong."

But the stimulus-response model has epistemological limitations, and these have implications for interaction design professionals. The key limitation is that such a model assumes the existence of certain interpretative skill in the first place. It's not always obvious to us, but understanding is a deeply cultural and learned ability. For instance, when we go to a museum or historical site, a docent not only relates historical

backgrounds and contexts, but more importantly *tells us what to look at*. But if it is right before our eyes all along (i.e., a visual stimulus), then why don't we respond the right way (i.e., with appreciation)? Why is it that a professional and amateur photographer standing side-by-side looking at the same thing will take very different pictures of it? How can a professional designer look at a given design material and come up with surprising and expressive new forms, where others simply rehash existing forms? Docents, accomplished photographers, and designers see and understand in richer ways than others do, and this is fundamental to their professional abilities.

Shusterman offers an explanation for these abilities by paraphrasing the work of 18th century philosopher Baumgarten, who first coined the term "aesthetics." For Baumgarten, in Shusterman's paraphrase,

> "The end of aesthetics ... is the perfection of sensory cognition as such, this implying beauty".... Baumgarten insists especially on "keenness of sensation," "imaginative capacity," "penetrating insight," "good memory," "poetic disposition," "good taste," foresight," and "expressive talent."
>
> -- Shusterman, 2000: pp. 264-65

In the stimulus-response model, and in most empirical science itself, such qualities have no meaningful place. Visual stimuli, and by extension empirical data, are seen to speak for themselves: the experiencing subject has only to perceive them to understand them. So stimulus-response is basically passive, and the model doesn't differentiate among responders. Much UX research in this tradition assumes that research subjects are fundamentally interchangeable and simply seeks to average their physiological or reported emotional responses (e.g., using Likert scales).

But what Shusterman wants to emphasize is—and here he is leveraging phenomenological hermeneutics and reader-response theory as well as pragmatism—that **understanding and hermeneutic skill must also exist *before* perception**. Though we often speak commonsensically as if object, lightwaves, visual perception, mental image, understanding, judgment, and decisionmaking all happened in a causal linear sequence, in fact it cannot characterize what actually happens. Meaning-making is an active process; meaning is not a form stamped in our cognition like a seal ring to wax.

Some people can perceive more keenly than others; some have more penetrating insights, some have a greater imaginative capacity. Importantly, these are not static "faculties" that we are born with, but rather "sensory cognition" comprises cultivatable abilities or habits that we practice and can improve over a lifetime. As Dewey writes of intelligence, it is not "the faculty of intellect honored in textbooks" [but rather is] "the sum total impulses, habits, emotions, records, and discoveries which forecast what is desirable and undersirable in future possibilities, and which contrive ingeniously on behalf of imagined good" (Dewey, cited in Bernstein, 1971, p. 211).

Somaesthetics is substantially responsive to the calls for a design sensibility in HCI because it offers an epistemological account of what such a sensibility actually is: a sensitive, imaginative, penetrating, tasteful, poetic, and expressive habit or disposition to design problems, materials, processes, opportunities, and situations. But how does one achieve such habit or disposition?

Somatic training

One of the signature pieces of Shusterman's somaesthetics is his call for somatic training: if it's the case that the body is the "tool of tools," then philosophers need to get out of their armchairs and cultivate their own somatic competencies. He defines this as "actually engaging in programs of disciplined, reflective, corporeal practice aimed at somatic self-improvement" (21.3.2).

To understand what he means by this, we might consider the practices that he uses to exemplify this: "diverse diets, body piercing and scarification, forms of dance and martial arts, yoga, massage, aerobics, bodybuilding, various erotic arts (including consensual sadomasochism), and such modern psychosomatic therapies as the Alexander Technique, the Feldenkrais Method, Bioenergetics, Rolfing, etc." (Shusterman, 2000, p. 272). Common to each of these is a long-term commitment to body refinement. This is not a question of mastering the body by feeding and exercising it according to recommendations from the health sciences; rather, this is a practice of self-stylization for which the body is the locus of one's individual stylized identity. The distinction I'm drawing here is akin to shaving one's head versus becoming a "skinhead." One is a mere physical description of a change to the body, whereas the other entails the same physical change but in such a way that it is inscribed in and defining a symbolic identity for the person doing it.

Thus, for Shusterman, the cultivation of somatic sensibility is an outcome of corporeal training. And surely he is right about this. I trained myself to skate well enough to join an amateur hockey league, and I also enjoy watching ice hockey. It is certainly the case that my appreciation for the watching the sport is partly based on a *somatic* understanding of the sheer skill of good players: people who have themselves tried to skate backwards

while turning and accelerating and also while controlling a puck and keeping it from an opposing player can almost physically appreciate the somatic aesthetics of such movements as they are displayed gracefully and effortlessly in a professional game. Surely people who go to the ballet, many of whom have had some dance training themselves, also appreciate somatically, almost "feeling" in their own bodies the somatic near-perfection of a professional dancer's alignments, body angles, and turnout. Indeed, how many somatic spectacles (e.g., professional sports, dance, rock concerts, etc.) do we enjoy that we *haven't* tried out in one form or another, whether it's backyard football, an *attitude en pointe* in front of the mirror, air guitars, or temporary tattoos?

Somatic training is also a part of HCI. We don't just talk about designs: we sketch them, prototype them, try them out, put them in people's hands and homes and watch what they do. These are all somatic exercises, and all of them require considerable training before anyone becomes good at them. Even among HCI researchers, the rising interest in critical design (e.g., Dunne, 2006; Dunne & Raby, 2001) and research through design (Zimmerman et al., 2007) extends this trend: such research uses design methodologies not in the hopes of creating new commercial products, but in order to generate knowledge and theory. Critical design is not easy to do, and seems to be an activity that requires iteration, practice, and training (Bardzell et al., 2012).

The other obvious area of HCI that involves somatic training is pedagogy. In our HCI/Design Master's program at Indiana University, students work in groups and individually to generate sketches, prototypes, workbooks, and portfolios within a studio culture in which they are frequently presenting their work for critique by faculty and peers. I don't think we're

unique in that: such pedagogy is a part of our field. Additionally, a majority of our students' Master's projects involve a domain with which—external to their participation in our program—they already have somatic training: we've seen projects building on prior experience in political activism, hardcore World of Warcraft play, fashion illustration, senior health care provision, and film production, among others.

Somatic training is substantially responsive to the call for a design sensibility because it relates design processes and practices to the underlying epistemology of an expert subject. Design processes are a form of somatic training: they entail disciplined embodied practices, and these practices eventually heighten perceptual and expressive sensitivities towards human needs, visual forms, problem reframings, socio-cultural meanings. It is by such mechanisms that designers train to become the kind of people who can, re-quoting Kuutti, "filter and crystallize cultural influences into effective and meaning-laden forms."

Somaesthetic Experiences

Much of my commentary thus far has focused on the suitability of somaesthetics as a theory that offers a rich and useful account for training the specialized sensibilities expected of design professionals. However, neither Shusterman nor the other pragmatists were seeking to support specifically the design profession: the pragmatist project is fundamentally geared to improving all human quality of life by reminding us that humans are organisms purposefully engaged in their lived environments, and not information processors or "disembodied ratiocinators" (in the memorable phrasing of Bannon & Bødker, 1991). And that means that somaesthetics also provides normative criteria for the design of aesthetic experiences for

users.

That is, if we want to reframe UX away from usability and towards something more robustly aesthetic, then we need to replace existing UX goals with new ones. Traditional ones include low task completion time, low error rates, high learnability, etc. Kutti (2001) proposes three alternative criteria that seem in the spirit of Deweyan pragmatism:

- Users as learners
- Users as shapers of their environment
- Users as becoming something else by using a device or a system

These sound like good goals, but their abstractness creates a practical challenge for designers. Here somaesthetic and pragmatist theory can begin to unpack some of these concepts. From a pragmatist perspective, aesthetic interaction should contribute to some combination of the following user experience-abilities. I combine "experience-abilities" into a single concept, because pragmatists stress how skills emerge in and from experiences; it is only by being challenged—not dumbed down with ease of use, transparency, and simplicity—that skills and aesthetic pleasure emerge.

The following are normative goods valorized by pragmatism in general and somaesthetics in particular. That is, an aesthetic interaction is one that adheres or contributes to some critical mass of the following:

- The experience and cultivation of Baumgarten's "**perfection of sensory cognition**," that is:
  - keenness of sensation
  - imaginative capacity
  - penetrating insight

    - good memory
    - poetic disposition
    - good taste
    - foresight
    - expressive talent (from Shusterman, 2000, pp. 264-65)

- The expansion of people's range of **sympathetic identification with others** (Guignon & Hiley, 2003, p. 36, paraphrasing American pragmatist Richard Rorty)
- A reformation of *objects* not as external to and in opposition to individual subjectivity, but rather seeing **objects as contiguous with human consciousness**, that is, seeing objects as human "activity in an objectified or congealed form**"** (Bernstein, 1971, p.46)
- An **orientation towards the future** (hope, intention, disposition), not the past (secure knowledge): "anticipation is ... more primary than recollection; projection than summoning of the past; the projective than the retrospective" (Dewey cited in Bernstein, 1971, 207).
- **An appreciation of (and contributions toward) consciousness as dynamic and emergent**, rather than static but wanting to collect more information. Consciousness is not a fixed form of mental seeing (i.e., disinterested understanding), but more along the lines of "the craftsman involved in doing and making.... The craftsman perfects his art not by comparing his product to some 'ideal' model, but by the cumulative results of experience—experience which benefits from tried and tested procedures, but always involves risk and novelty" (Bernstein, 1971, paraphrasing Dewey, p. 219)
- **Ongoing somaesthetic training, self-improvement, and self-stylization**. If experiences of art and beauty are distinctive for the powerfully gratifying ways they absorb our attention, unify our consciousness, and engage our emotions, then increasing our powers of awareness, focus, and feeling through better mastery of their somatic source could render more of our experience similarly rewarding in such ways. (Shusterman 21.1)

An aesthetic experience is one in which (a) the aesthetic goods listed above are *experienced* or *felt*, and also (b) the experience of them contributes to the long-term *somaesthetic skills* of insightful perception, imagination, meaningful self-stylization, and a disposition to do good.

All of this is not to suggest that every single interaction design must meet all of the above norms; rather, pragmatist holism would seem to suggest that interactions need only to contribute to and participate in lived ecologies where these qualities are experienced and subsequently cultivated through practice into skills. It is the lived world that ideally needs to have these qualities, not every single thing a person touches within the lived world. But inasmuch as our lived world is artificially designed—buildings, clothing, parks, appliances, furniture, and now interactive technologies—the burden is on us as designers to make that artificial world humane.

Somaesthetics offers normative criteria and a conceptual vocabulary to facilitate the design and evaluation of humane interactive products.

Criticisms and Limitations

It is probably obvious that I am sympathetic to somaesthetics and believe that it can contribute to HCI and interaction design. But one bad habit that we as a field have is that while we are eager to advocate for the introduction of a given theory, we often don't acknowledge that this theory has confounds or limitations. I have tried to argue some of the specific ways that somaesthetics can contribute to HCI, and I think it's also important to explore some of the ways it is not particularly well positioned to contribute to HCI. By exploring both strengths and limitations, as a field we can use theories more effectively and have some sense for when alternative theories are needed.

Somaesthetics is only loosely coupled with

methods

HCI is a field that likes its methods, and it's not clear how somaesthetics translates into methods. More fundamentally, it's not even clear whether somaesthetics should translate into methods, at least not in the sense that the term is used in the sciences. At stake is an epistemological disagreement about how best to produce knowledge. A traditional experimental methodology, such as that described by Tractinsky in his interaction-design.org Encyclopedia entry on Visual Aesthetics, isolates variables in controlled experiments—classic methods from experimental psychology. For Kutti at least, such an approach is the antithesis of how designers operate:

> "Thus from the viewpoint of a designer, HCI people were not designers but "barbarians," uneducated technicians lacking any understanding of the aesthetics and complexity of the cultural filtration involved in a design. This suspicion was strengthened by the HCI people's obsession on methods instead of personal judgment.
>
> -- Kuutti, 2009: p. 8"

Kuutti seems to establishing an exclusive opposition between expert judgment-based approaches and methods, a position also suggested by Greenberg & Buxton (cited earlier). Indeed, the very existence of methods seems to dumb scientists down into "barbarians." Kuutti's provocative language aside, it is easy to understand why scientists might view personal judgment as lacking any methodological rigor and thus barely any better than "mere opinion," and why designers might view scientific methods as replacing human judgment with mechanistic algorithm-like recipes, which would seem to be a form of intellectual "barbarism." Though it's

easy enough to understand these caricatures, it's less clear whether they have any validity or in fact if they mainly just exaggerate differences. Dewey harmonized scientific and artistic approaches, but he did so by treating the sciences as an aesthetic practice, a position that might not appeal to practicing HCI scientists (though there is not as much daylight between Dewey's position and that of post-positivist science, e.g., Quine, as one might expect).

Regardless of how apparent or real the opposition is between expert judgment and scientific method, it's not clear to me that somaesthetics is going to resonate with interaction designers for whom data and methods are paramount.

Somaesthetics says little about the content of actual experiences

In a recent paper, Hassenzahl, Diefenbach, & Göritz (2010), who operate within a cognitive approach to UX, criticize McCarthy & Wright's pragmatist take on UX as follows:

> "With their emphasis on ''values, needs, desires and goals," McCarthy and Wright (2004) are in line with accepted psychological theories (see Carver and Scheier, 1989), which understand action as being permanently shaped not only by the context and conditions on an operational level, but also driven by overarching, universal psychological needs. The question at hand, however, is what these ''values, needs, desires" are. In fact, McCarthy and Wright (2004) seem to explicitly avoid any commentary on the content of ''needs." This is due to a critical view of attempts to reduce, what they call ''felt experience", to a set of generalized concepts."
>
> -- Hassenzahl et al (2010): p. 354

What Hassenzahl, Diefenbach, and Göritz are getting at is that there is an empirical dimension to experience, that is, users of a given design do have an experience *e*, it should be possible for research to discover the content of that *e*, and that McCarthy & Wright's approach categorically fails to address that question, because it offers few strategies to capture "what these 'values, needs, desires' are"—which is an empirical, rather than critical, question.

I think there is a valid point here. I do see value in McCarthy & Wright that Hassenzahl, Diefenbach, and Göritz apparently do not, but I can understand why they read McCarthy & Wright in that way.

And now I will also add that I think a somaesthetic approach to HCI basically has the same shortcoming for basically the same reasons. Again, while somaesthetics is strong at offering an account of how an individual trains or cultivates the self as a perceiver and expresser (not just a thinker), it offers fewer tools to try to understand the content of particular experience *x*, and yet designers do have reason to want to know that.

Shusterman's stock of examples isn't particularly helpful

For an encyclopedia entry on interaction design, Shusterman not only used examples that take a lot of work for HCI readers to understand in the way that he wants them to, but he also missed opportunities to explore somaesthetic HCI with appropriate examples from the field. It is, of course, easy to explain this problem as a result of Shusterman's outside status. Nonetheless, it is a huge missed opportunity, not just rhetorically (in

terms of his ability to persuade HCI readers to engage with somaesthetics) but also substantively (some examples from HCI surely would help everyone think more deeply about somaesthetic HCI).

An obvious starting point is the field of robotics, in particular robotic work for domestic settings and everyday contexts, where the robots are designed to be appropriately meaningful as computational bodies in everyday life. Robot designer Tatsuya Matsui, for example, "believes that robots are like flowers. They can be delicate and beautiful. They are endearing and need nurturing" (Hornyak, 2007), a somaesthetic concept that is undeniably visible in his work:

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Figure 21.1 A-B: Robots designed by Tatsuya Matsui

Beyond robotics, several areas of HCI have explored embodied computational artifacts in relation to human embodiment. Another work is "Soft-Spikey Mouse," created by artist Youngsuk Altieri working with Heekyoung Jung and myself:

soft-spiky mouse

Young Suk Lee

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Figure 21.2: “Soft-Spikey Mouse,” created by artist Youngsuk Altieri working with Heekyoung Jung and Jeffrey Bardzell

So when Shusterman writes, “At this stage in somaesthetics research, we have only been concerned with somatic feelings of human bodies and thus with only one side of the HCI interaction. But, in principle, it may be possible to consider the somaesthetics of nonhuman somas, including computer bodies” it is clear that he simply has not yet engaged with the considerable amount of work in our field that has already been doing precisely that for decades.

As I imagine how such examples might influence Shusterman’s thinking, and how much I want to hear what he has to say about such work, it becomes clear to me that somaesthetics just might benefit as much from HCI as the other way around.

And I wouldn’t have it any other way.

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Commentary by Kristina Hook

In designing for bodily experiences, there has been a lack of theories that can provide the underpinnings we need to understand and deepen our design thinking. Despite all the work we have seen on designing for embodiment (Dourish, 2004, and others), the actual corporeal, pulsating, live, felt body has been notably absent from both theory and practical work. At the same time, digital products have become an integral part of the fabric of everyday life, the pleasures (and pains) they give, their contribution to our social identity, or their general aesthetics are now core features of their design. We see more and more attempts to design explicitly for bodily experiences with digital technology, but it is a notably challenging design task. With the advent of new technologies, such as biosensors worn on your body, interactive clothes, or wearable computers such as mobiles equipped with accelerometers, a whole space of possibilities for gesture-based, physical and body-based interaction is opened.

Some claim that the technologies we wear today treat our bodies in a negative way:

> “Electronics, robotics, and spintronics invade and transform the body and, as a consequence of this, the body becomes an object and loses its remaining personal characteristics, those characteristics that might make us consider it as the sacred guardian of our identity.”
>
> -- Longo, 2003

How can we do a better job in interaction design involving our bodies — *the sacred guardians of our identity*? This is where I think Shusterman's theories of somaesthetics are relevant.

Three questions: What experiences? Articulation? Experiential qualities?

To design for corporeal, bodily, movement-based interactions, speaking to our senses and aesthetic experiences is difficult. Three questions immediately pops to my mind. First, what kinds of subjective, pleasurable or displeasurable, experiences are we aiming to design for? Glossing them over as all being about designing for *flow* (Csikszentmihalyi, 1990) or good *gameplay* experience is too vague (as we argue in Isbister and Höök, 2009). We need to drill deeper and better understand exactly what experiences we are talking about. Are we designing for pleasurable or unpleasurable ones? Are we designing for those that are subjective and unique, or ones that are common and shared? Ones that deliver serendipitous experiences or ones that are evocative and emotional? These are not all the same, even if they all emphasise aspects of bodily experience.

> “A particularly difficult issue lies in understanding how these kinds of experiences may unfold over time — both in the particular interaction with and

> manipulation of the artefact but also as parts of our everyday on-going lives. As Löwgren puts it, a gestalt for interactive artefacts is defined as a "dynamic gestalt" which "*we have to experience as a dynamic process*.
>
> -- Löwgren, 2001: p. 35 - 36

Second, once we know what kind of experience we are aiming to design for, we need to *articulate* them in a form that makes sense and that we can share within a design team. Ways of knowing can arise from your bodily acts without any language translation in-between. The feel of the muscle tensions, the touch of the skin, the tonicities of the body, balance, posture, rhythm of movement, the symbiotic relationship to objects in our environment — these come together into a unique holistic experience. It is not the ability to fulfil a task, but the experience of the corporeality of doing so that matters here. Those descriptions also need to be shared with the users that we invite to test our designs, or even participate in the design process.

Thirdly, if we try to design interaction that builds on bodily movement, seeking certain experiential qualities, many different aspects of the interaction have to be fine-tuned to enable the experience, as, for example:

- the *timing* of interaction: movement has to render response in exactly the right moment for exactly the right kind of length of time in order to create for a particular experience (Sundström et al., 2005)
- linking *emotion and movement*: certain movements and body postures are more likely to coincide with certain emotional experiences (Darwin, 1872, Sheets-Johnstone, 1999, Laban and Lawrence, 1974, Moen, 2006, Paiva et al., 2003)
- *harmony of modalities*: the modalities of the interaction, such as graphics, haptics or gestures, all have to speak together — harmonize (Ståhl, 2006)

Before turning to what Shusterman and his work on somaesthetics can provide us with here, let me remind just give a few examples of how bodily interactions have been seen in the field of HCI or interaction design.

Strands of interaction design dealing with bodily interactions

Ergonomics

In ergonomics (preceding HCI — see Grudin 1990), the actual physical body is the core focus. The body has been measured and designed for in spaces such as airplane cockpits, cars or nuclear plant control rooms. As pointed out by Harper and colleagues, the perspective taken is one where humans are seen as part of a machine. The pilots, car drivers and factory workers are part of a larger machinery. They must be trained to follow certain routines automatically as if they are one part of the machine. The machinery must be fine-tuned so that human error is minimized and this can only be done through designing the machinery to fit with meticulous measurements of our physical capacity. In those situations, we want to see our bodies as machines, able to follow routines and act in error-free ways in the spur of a moment (Harper et al., 2007).

While it may sound negative to take such a narrow view on the body, treating it as a machine, we must remember that sometimes we really do want to see ourselves as machines. It is of key importance to us that risks are minimized with driving a car or controlling a nuclear plant. Ergonomics has also cared for the body, aiming to avoid harming the body. By changing the way a machine works, its users can fit better into the

machinery. But in ergonomics, for the most part, we assume the body to be passive — the interface will be sending signals to the human body that the passive body receives, sending onwards to the way more important mind. The body is not a subject, actively perceiving and acting.

Cyborgs

Another position towards the body sometime taken in HCI is that of *cyborgs*. A cyborg consists of both artificial and natural systems, or to phrase it differently, of both human body and designed tools that extends out capacity. In its simplest form the extension can be the stick that a blind man uses to find his way. The stick becomes a part of how he feels the world, an *embodied* part of his own body. But framing tools as part of our cyborg existence goes beyond this one- way extension of our bodies. The cyborg concept comes with various ethical and moral implications when we regard how the technical tools we extend our bodies with in turn speak back to us. This positive side of being a cyborg is in some sense that we can free ourselves from our bodies — as discussed by the feminist Donna Haraway in her cyborg feminist writings (1991). The focus in this movement is on extending the mind, freeing us from our corporeal reality.

While this body-less cyborg being on the internet was much discussed in the beginning of the virtual reality-era, the pendulum has now swung back and most regard it as bad behavior to not connect your real identity to your virtual identity. In addition, more and more technologies are tying reality and virtuality more strongly together, entering our physical selves into the virtual spaces. For example, in the computer games area, we have new interaction devices, such as WII, fake guitars in Guitar Hero, or mobiles, connecting more strongly with our physical selves.

Trimming the body

A growing body of work, focuses on the body itself as the domain or the focus of attention. Here, HCI focuses on interactions for sports, healthy living, or physical activity. These systems often treat our bodies as objects that we can study from the outside, that can be trimmed and controlled. Again, the body becomes subordinate to mind, as an instrument or machine, passively receiving sign and signals, but not actively being part of producing them.

These kinds of systems may have many benefits; relieving our bodies from pain, creating interesting experiences, or making us healthy. At the same time, by making the body into a machine that can be measured and studied as an object, we risk putting 'goals' and 'tasks' to our bodies without turning to our felt life. Pedometers measure how many steps we take and the goal becomes to walk at least 10.000 steps per day — not matter how we feel about walking that particular day. Again, many of these systems reinforce a dualistic stance where the body is a separate entity that can be measured and dealt with as an object. It is not the sensory-locus of ourselves.

Third wave

In the "third wave" of HCI, design for experiences goes beyond those of task completion, efficiency, and tool-based perspectives. This includes designing for bodily experiences. So far, when it comes to involving bodies and creating for bodily experiences, the focus has mainly been on sports and games (e.g. from early work (Ishii et al., 1999) to current (Benford et al., 2012)). The aim is to design for experiential qualities such as flow,

immersion or uncomfortable experiences. But there is also a growing body of designs aimed at other experiences. One example is Moen's Body Bug — a wire that you wrap around your body where a 'bug' registers your actions and climbs up and down a wire (Moen, 2006). The bug is a simple robot, moving along the wire. When you strap the wire around your body and start making movements, the bug will move along the wire, in a sense mirroring your movements. The bug makes you want to 'dance'. The sought experiential quality is that of enjoying your own body movement as we do when we dance.

To reach designs in which such qualities arise, designers and researchers have repeatedly reported that as designers, we need to experience our own bodies in the design process (Hummels et al., 2007). This in turn requires new methods in the design process.

Recently, we have started to see other studies where HCI researchers attempt to observe different cultures or communities of practice, for insight on how to design for novel bodily experiences. There are ethnographic studies about hunting culture (Juhlin and Weilenmann, 2008), skaters and golfers (Tholander and Johansson, 2010), horseback riding (Höök, 2010) to citizens constrained by electronic surveillance bracelets (Troshynski et al., 2008). These studies repeatedly tell us that bodily experiences have been undervalued in ICT design and that there is little knowledge on how to address them.

The study by Tholander and Johansson (2010), on skaters and golfers show that those practices do not distract their users from being in the world together with their skateboards or golf clubs. Tholander and Johansson convincingly argue that interactive technologies that aim for physical

interaction too often force users to interact through some type of screen interface, taking away focus from the environment. Instead of interacting with others around us or with the surrounding nature, we focus on the screen.

The study by myself on horseback riding, (2010) I try to provide a rich account of how horseback riding involves all our senses, at moments involving us in *centaur*-experiences — feeling as one with horse and environment. My point is to show both how impoverished interaction with many of our interfaces are compared to the sensory richness of riding, and also how impoverished our articulations of interactions are, the lack of an agreed upon language for describing interactions.

Troshynksi and colleagues, in their study on paroled sex of- fenders who are required to wear a GPS tracking electronic bracelet on their ankle (2008), show how this technology constrains their bodies in ways beyond that of the original intent of the technology. A considerable amount of work is put into preserving the technology intact during everyday routines like showering, and their mobility in the environment is considerable constrained, among other implications.

All of these studies point to limitations in the ways we think of today's wearable and mobile technologies and their impact on bodily behaviors and practices.

What Shusterman brings to the table

From this brief walk through some of the work involving our bodies in digital interactions, we can now turn to Shusterman's work and perhaps

see a bit more clearly why his theories on somaesthetics are appealing to some of the interaction design researchers in our field.

When designing for a non-dualistic stance towards body and mind, we need some way of talk about what experiences we strive to engage ourselves and our users into. While most accounts of corporeal involvement will be mainly descriptive, Shusterman's somaesthetics is also *normative*. He tells us that by engaging in certain practices, in inward listening and learning, we can know ourselves better, and thereby understand and interact with others more fully. It trains our empathy — both with ourselves and others. While this may all sound mysterious and fluffy, the take away message is, in my view, not religious or mysterious. It simply says that we can train our bodies, our muscles, our nervous system (including the brain), to become more knowledgeable and aware of ourselves. As I am a horseback rider, I know that any predominately movement- and body-based practice requires this kind of training and knowledge.

As mentioned above, I have tried to describe the complexity of knowledge required to ride a horse in an autoethnographic study (Höök, 2010). The interaction with a horse is obviously not word-based. It happens through physical signs and signals: the riders use the muscles in their legs, the placement of their sitting bones, bodily balance, head movement, hand and arm connection to the horse's mouth and sometimes tone of voice. The horse talks back through its movement, direction, pace, activations of muscles that can be felt throughout the horse's body, its head movements, tail movements, flipping ears, bend of neck and noises. In order to be a good rider, you need to learn this wordless language. As in any language, understanding and communication arises in interaction over time. When

you have experienced a particular bodily schema or concept yourself this understanding may arise.

When designing digital interactions, we should be able to articulate, shape and design for equally detailed descriptions of movement, body and physical signs and signals flowing back and forth between us and the system we are designing.
More importantly, as Shusterman points out, moving your body is not only a matter of performing a function, it is also an *aesthetic* experience. There is a plenitude of activities that we do for the pleasure of moving — dancing, sports, jogging, cycling. The pleasures of these activities are of course not only soft, flowing movements, since some of the activities involve pain, applying yourself really carefully to make your body do them, adjusting your own body in various ways, even making your body build certain muscles that you normally do not use so much, embarrassment when you do not get it right, and so on.

Interaction design has perhaps been a bit too obsessed with zero-learning time, an issue that will not sit well with some of the movement-based practices Shusterman is advocating. A take-away message from Shusterman is that it takes time to learn. You have to apply yourself. Getting to know yourself, your own body, changing your movements, training yourself, is not "natural" — even if your body is "there for you" all the time. Similar to how you must learn to think and reason, you must learn how to listen to your body, how to improve your body knowledge.

Turning to design

As pointed out by Bardzell in his comment to this chapter, the translation

from theories of somaesthetics into HCI and interaction design is non-trivial.

Obviously, any body will have different parts (legs, arms, brain, nervous system) and different processes in that body will have different characteristics, but they are intimately linked. Likewise, bodies move through difference spaces, social and physical, shaping interactions. Or as put by Suchman picking up on Latour, unavoidably a part of complex temporal, material and social assemblies, the body is unceasingly (re)configured in relational terms. We perceive, act and understand the world as unities of mind, body, routine, culture, social settings and with machines as part of our ways of being in the world. The design process needs to consider the connections between these processes, moving beyond a narrow focus on cognition as it happens in our brains.

In particular, I have been interested in the linking from movement to emotion and back. Early on Darwin made a strong coupling between emotion and bodily movement (Darwin 1872). Since then, researchers in areas as diverse as neurology (LeDoux 1996; Davidson et al. 2003) to philosophy and dance (Laban & Lawrence 1974; Sheets-Johnstone 1999) describe the close coupling between readiness for action, muscular activity and the co-occurrence of emotion. Sheets-Johnstone makes the case that:

> “Without the readiness to act in a certain way, without certain corporeal tonicities, a certain feeling would not, and indeed, could not be felt, and a certain action would not, and indeed, could not be taken, since the postural dynamic of the body are what make the feeling and the action possible.(”
>
> -- Sheets-Johnstone 1999: p. 265

Or as Dewey puts it:

> “There is, therefore, no such thing in perception as seeing or hearing plus emotion. The perceived object or scene is emotionally pervaded throughout.”

If we attempt to define a lived emotional experience in dualistic terms, we will surely fail, but with a perspective where man is seen as a whole, both body and mind, both individual and part of the world, the gulf between our interpretative experiences and what can/cannot be studied will not be as problematic.

Just to make it slightly clearer, here is an example of such a co-occurrence of emotion and movement from my horseback riding account:

> “As horse and rider move together, they create a rhythm. Depending on the gait, it can be a two-beat (trot, pace), three-beat (canter), or four-beat (walk, gallop, tölt), in different paces. To allow the horse to keep the beat in a balanced way, the rider needs to make herself invisible in the saddle, not disturbing the rhythm. [..] The problem was that I was sitting back into the saddle with a ‘splat’ slightly out of rhythm with the horse. Given how many years I had been riding before going to lessons with Christian [my horseback riding teacher], it was horribly embarrassing for me to be out of synch. Following the rhythm of the horse is one of the most important pleasures of riding. As discussed by others (Moen, 2006), rhythmic movement as in dance or riding, moves us in way which are immediately appealing. But just as it can be very awkward to watch someone dancing out of rhythm, it is very awkward to experience it. [..] The embarrassment came from the actual physical experience of being out of rhythm. Our bodies are used to rhythms, our own bipedal swagger (Sheets-Johnstone, 1999), our mother’s heart beat, waves beating the beach, music and dancing, and, for those who are fortunate enough to experience it: the horses’ different gaits.”

Translating from this experience in horseback riding, we can see many possible digital interactions picking up on rhythm. Take for example the work by Danielle Wilde named hipDisks recently exhibited at CHI 2012 (Wilde, 2012):

> “Possibly the most undignified musical instrument ever, hipDisk exploits changing relationships between torso and hip to actuate sound. Simple horizontal disk-shaped extensions of the body exaggerate, so make highly visible, the interdependent relationship of the hip and torso. Soft switches, strategically placed around the perimeter of each disk, allow the wearer to play a chromatic scale, and so play simple melodies, restricted only by flexibility and speed of swing ”
>
> -- Wilde, 2012

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Figure 21.1 A-B-C: Thecla Schiphorst dancing with Danielle Wildes' Hipdisk

A designer that has picked up more directly on somaesthetics (and who is also commenting on this chapter) is Thecla Schiphorst. She suggests interactions and design methods that require particular movements, such as moving very, very slowly in order to listen to your own bodily state in interaction or attaching users by velcro asking them to move and interact together in order to explore extensions of the body and their meaning in terms of privacy (Schiphorst, 2007). She has also built a couple of systems, like soft(n), that explores the somaesthetics of touch and interaction through interactive artifacts:

> “The soft(n) installation is an intelligent tangible network comprised of soft physical objects that exhibit emergent behavior through interaction. soft(n) is a group of 10 interactive soft objects, each containing a specially designed and custom-engineered multi-touch soft input surface and motion detectors. Each soft object has an ability to actuate vibration, light and sound in response to its tactile induced state.”
>
> -- Schiphorst, 2009

Another compelling example is the work by Høbye and Löwgren on the system named Mediated Body (2011). A performer and a participant both wear earphones and through turning them into human antennas, they can generate evocative music when they touch each-others’ bare-skin or “auras”. Again, this invites a somaesthetic, in this case, social experience.

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Figure 21.2: Richard Shusterman and Kia Höök using the 'Mediated Body' system at the CHI 2012 conference.

In my view, apart from using Shusterman’s somaesthetic theories to train

ourselves as designers or train our users to express what they experience (as discussed by Bardzell in his commentary), I believe that we can build some of the ideas into the actual designs of interactive systems.

In summary

In a sense, the interest in emotional experiences and third-wave HCI has served as a bridge for the whole field of HCI to turn from symbolic, analytical ways of doing task analysis and designing for efficient ways of supporting tasks, to caring more about experiences in general. It has also, to some researchers in HCI, served as a bridge to start addressing our physical, corporeal bodies in interaction and to attempt to bridge the dualism chasm.

This has, in turn, created a huge space of opportunities for design that puts our bodily ways of being in the world first and attempt to address our corporeal experiences. The systems we have been designing in my group (eMoto, Affective Health and others — turn to the chapter on Affective Interaction in the Encyclopedia of interaction-design.org for a longer description) have all been attempts to address the interaction between emotion and movement. While each of these systems has its deficiencies, none of them is trying to reduce human experience to something that can be measured and modeled, and then packaged as an information piece to be sent to others. They are "non-reductionist" (Höök et al., 2008). The experience of using them emotionally and corporeally is shaped by the participants. In a sense this becomes the "participatory design"-movement of the third wave of HCI (Höök, 2006).

It remains to be seen how we can translate the insights from Shusterman's

work on somaesthetics into design. And perhaps, we will have to look for other, complementing theories of bodily interactions, sometimes with less normative perspectives on what is good and what is bad, and perhaps with a stronger orientation towards our socio-bodily practices. Most of all, if we continue to create interactions that come closer and closer to our bodies, our "sacred selves", we need to be guided by some values or ideas of why and how to do so. The world is flooded with crappy technologies that harm our bodies and our means to be corporeally present in the world, together with others. Addressing aesthetics of the soma, also means addressing important values in design.

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Commentary by Erik A. Stolterman

Humans have bodies. Bodies are not only the physical mechanical carriers of who we "really" are. Humans interact with and through their bodies. Users are humans and have bodies. Human computer interaction is therefore about bodies as well as cognitive and emotional minds. All this has become a concrete practical reality over the last decade to anyone involved in interaction design. New interactive technology has changed interaction away from being purely representational (commands and text)

to direct and bodily interactions (touch, haptic and gesture) and away from being purely screen based to being embedded in and parts of our physical artifacts and environments.

This development means that interaction designers are more than ever before challenged by bodily aspects of interaction. This has of course been addressed both empirically and theoretically within our field through notions such as, ubiquitous computing, embodied interaction, tangible interaction, haptics, gestures, etc.

In contrast to what is common in our field, Shusterman delivers a more profound approach to the challenge of bodily engagements with technology. As a philosopher and as the founder of the term somaesthetics, Shusterman has over the years, in a serious and foundational way, developed an "integrative conceptual framework" for a better understanding of "somatic experiences" (quotes from his article).

What Shusterman can do, that few in our field can do, is to ground the phenomena and ideas related to bodily interactions in a historical and philosophical context and scholarship. This is extremely helpful for our field and it pushes HCI research forward to a more developed understanding.

It is hard to argue against the basic position that Shusterman present. He writes: "By exploring the fundamental features of our embodied ways of engaging the world and transforming it through action and construction, somaesthetics can provide useful insights and experiential skills to help designers produce products and situations that provide more rewarding and pleasurable experience." Few would argue against the idea that we can

obtain other insights about our reality when we "use" our body as a sensory "tool" than if we solely approach it through intellectual and cognitive means.

Reading Shusterman's article is interesting and potentially useful for anyone involved in interaction design, especially when engaged with any kind of physical aspects of interactive artifacts. However, while Shusterman delivers an excellent account of the theoretical and philosophical aspects of embodiment and somaesthetics, I am somewhat disappointed when he more directly tries to describe how this can be applied or used in interaction design.

Shusterman does this by bringing somaesthetics aspects not only to the relationship between a user and an artifact but into the design process and to the thinking and doing of a designer. He writes for instance "... the body is our indispensable tool of tools" in a design process. He continues "... designers could improve their design skills by becoming more aware of how they use themselves and how they feel when using particular products rather than merely thinking of how the product is conventionally used." Of course, it can be argued that this is already common practice in interaction design, since prototyping already is a core activity in our field. Working with material prototypes at any level of fidelity means that the designer or user engages in bodily explorations of ideas. Prototypes are in most cases physical manifestations of design concepts that are developed explicitly with the purpose to explore precisely what Shusterman suggests, namely how a designer or user "feel when using a particular product rather than merely thinking of how the product is conventionally used".

It might be fair to acknowledge that when Shusterman talks about using

the body as a tool he is in many ways more bodily oriented than what is the case when exploring prototypes. For instance, he also sees bodily engagements as a way to explore more abstract ideas concerning potential design directions. However, the idea of using the body as a tool in design activities has also been more directly explored in our field through techniques such as "body storming" and similar methods. So, while Shusterman provide a philosophical foundation for many of these bodily oriented design process activities, it is also clear that designers are already engaged in somaesthetic activities as a way to better understand design ideas and user experience.

Shusterman mentions a few examples of what designers can do to develop a more somaesthetic understanding of their prototypes and designs. But again, for many interaction designers these examples are quite similar to what they already do during prototyping, design sessions, evaluations, etc. For instance, Shusterman writes that "A comparative study of how different shapes of cup handles affect one's feelings towards drinking, for example, could be used to improve cup design. Does the handle make your forefinger grip tightly, and how does this affect the rest of your arm, the rest of your body, and by extension, the feeling of drinking?" This example could be found in any interaction design textbook on the notion and evaluation of user experience design. What Shusterman proposes is if phrased in the everyday language of interaction design practice a matter of prototyping and contextual evaluation of artifacts in use. The basic belief in interaction design is that since these artifacts are objects and have physical properties, their properties influence the whole user experience and to develop an understanding of that experience, of course the artifact has to be examined in a way that includes the embodied aspects of

interaction. So, with this example Shusterman is not really opening up anything new to most interaction designers, instead the example can probably backfire and make the theoretical contribution to appear less interesting.

Another example that Shusterman mentions is HRI (human robot interaction). This is an area where a lot of research is already focused on how people experience the way robots move and in particular how their "bodies" are designed and how humans can, want to, or refuse to (bodily or otherwise) interact with these artificial bodies. For instance, a lot of research has been devoted to the bodily aspect of facial expressions, arm movements, even the embodiment of free roaming "smart" robot vacuum cleaners. In HRI the somatic aspects of design becomes almost unavoidable. There is no traditional interface, there is very little interaction related to disembodied intellectual and cognitive aspects through representational interaction. Instead, robots are themselves embodied and the interaction with humans is embodied from both sides. So, it can be argued that HRI is not, as Shusterman suggests, a potential area for somaesthtics, instead it is a field where somaesthetic approaches are unavoidable and already in practice, even if not theoretically refined.

The article of Shusterman exemplifies something that is quite common when it comes to design (research) and that is the difficulty of transforming advanced theoretical constructs into relevant and practical support for actual design work. We have over the years seen several examples of theoretical and philosophical approaches that have been both recognized and influential in academia as important scholarly contributions. However, many of these, such as Activity Theory, Distributed Cognition, and others, have proven to be difficult to translate

into recommendations for practice and few have successfully reached a broader audience among practitioners. Yvonne Rogers (2004) offers an excellent account of this situation, with numerous examples and explanations of why this is a challenge to the field. Another treatise of the same topic can be found in my article (Stolterman, 2008) where I introduce the notion of "rationality resonance". This concept manifests the idea that any theory, to be practically relevant, has to be based on a deep understanding of existing practice. There has to be a resonance between the existing rationality in practice and the "new" rationality manifested in the proposed theory. This is of course not an issue for theories that only claim to contribute to our understanding of the field, but as soon as a claim is made that a theoretical construct is "useful" in practice this becomes a critical issue. The rationality embedded in a theory with such a claim must resonate with existing rationality in practice, that is, the theory needs to be based on a deep understanding of practice in all its richness and complexity. This means that the proposed rationality has to resonate with or at least pay respect to every aspect relevant in practice, such as, management, resources, time, skill and competence, even if these aspects are not core to the theory.

The theoretical and philosophical foundation that Shusterman offers is, in my view, excellent and should be required readings for any designer engaged with embodied interaction. But I find that the proposed theory or more precisely the suggested practical applications does not yet show enough resonance with existing practice or pay enough insight and respect to the complexity of existing practice. At the same time, it is unclear to what extent the practical design side of somaesthetics isn't already practiced. Maybe what many interaction designers are already doing in

their serious attempts to capture people's overall experience of interacting with artifacts are already examples of a somaesthetic approach. If so, then Shusterman's contribution is not to be evaluated in relation to how "useful" it is but to how well it establishes a scholarly and philosophical foundation that existing practice may relate to and rest upon. If that is the case then instead of reading somaesthetics as an approach for design it could be used as a suitable tool for analyzing and understanding existing practice. But, if somaesthetics is actually meant to be seen as something radically different when transformed into practice then we are still looking forward to that to be developed and explained.

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Commentary by Youn-kyung Lim

It was around 2006 when I first encountered the term, somaesthetics. As a part of my research activities, I was searching for the most appropriate philosophical discourse for human dynamic bodily experience. At that time, I was developing a new approach for understanding and designing the invisible but tangibly experiential qualities of interactive artifacts. When I came across the concept of somaesthetics, developed by the

Richard Shusterman, I became fully convinced that the idea of designing "interactivity qualities" is valuable and furthermore, that somaesthetics may form the core for further developing this idea, more specifically through interactivity attributes (Lim, et al., 2007; Lim, et al., 2009; Lim, et al., 2011).

For a HCI design researcher like myself – who very much appreciates the perspective of aesthetics of interaction – the most intriguing part of the concept of somaesthetics is that it provides the conceptual framework for *consciously* explaining the "sense of quality" that is sourced and experienced from our bodily senses when we interact with interactive artifacts. Somaesthetics is not merely about bodily experience but more about the *articulation* of such experience. It is about *body consciousness* (Shusterman, 2008; Shusterman, 2011). The excerpt from one of my papers (Lim et al. 2011) below may describe the primary effect of such consciousness in the perspective of quality-centered design.

> "The body becomes a tool for discovering new experiential spaces-but making the body *conscious* of what it experiences, and able to articulate that consciousness, is critical. Through the help of increasing consciousness, the quality sensibility can be increased, and this will lead to the experience of a higher aesthetic quality"
>
> -- Lim et al. 2011: p.115

Somaesthetics is often applied in theatrical contexts to analyze performers' somatic styles of movement and postures, as Richard Shusterman mentions. Shusterman also notes that somaesthetics is not only about the performers but also about the observers of the performers. As a thought experiment, let us substitute the performers with interactive

artifacts and the observers with users, or vice versa. Such mapping provides a new way of thinking about the relationship between a user and an interactive artifact. More specifically, such mapping allows us to focus on the *somatic* styles of movements and behaviors of the interactive artifact while interacted with by the user. Conversely, the interactive artifact may also interpret the user's movements and behaviors based on his or her somatic styles and respond to these in an appropriate way. As interaction designers, we can become conscious about this somatic relationship in our designs, and thus open a new space to be explored. It may also be appropriate in the context of robotics design as well.

In this way, the philosophical concept of somaesthetics extends the discourses around - and understandings of - our current concepts in Human-Computer Interaction. Somaesthetics may move our concepts in new directions. To me, somaesthetics is a very strong and effective philosophical concept to be learned and applied in interaction design especially when we are interested in *experienced* qualities of interaction. When we face emerging interaction technologies such as touch interfaces and gestural interfaces, this philosophical concept may, in my opinion, assume an even stronger role in Human-Computer Interaction.

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