Systems Intelligence

a New Lens on Human Engagement and Action

Edited by RAIMO P. HÄMÄLÄINEN and ESA SAARINEN

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Why Systems Intelligence?

Raimo P. Hämäläinen and Esa Saarinen

Our conviction is that human beings have an instinctive capability to face their environment from the point of view of engagement. This fundamental capacity is action-oriented and adaptive, holistic, contextual and relational, and links the subject to her environment as an ongoing course of progression. It amounts to an ability to connect with the complex interconnected feedback mechanisms and pattern structures of the environment from the point of view of *what works.*

We have suggested that it is useful to refer to this fundamental human capability as *systems intelligence.*

Our proposal assumes that it is useful to conceptualise human action and behaviour as taking place in the midst of *systems*: complex wholes which have properties that emerge from the functioning of parts many features of which are due to their connectivity, modes of interaction and mutual interplay.

The systems intelligence perspective approaches the human condition as an on-going engagement with wholes, and the wholes as "systems". An integrated whole on the move within the time axis, that is a system. Most distinctively, a system in this sense could be but need not be mechanical, controllable or knowable. Yet humans do possess operationally functional intelligence vis-à-vis such systems, thus succeeding to live in the midst of evolving complexities. We believe it is useful to have one phrase to refer to this fundamental human endowment: systems intelligence.

Systems intelligence may involve but does not reduce to objective knowledge *of* systems or intelligence *about* systems. There is no subject-object distinction implicit in systems intelligence, and the "systems" of systems intelligence need not be thing-like "objects" for an intelligence to focus upon from without. An infant is systems intelligent with her mother, and the mother with the infant: neither needs to know objectively what they amount to as a system, for that system to work.

The "systems" of systems intelligence are constructs, which have proved useful in the course of evolution or in the context of a particular human endeavour. Because the "systems" might not exist out there as objective entities, the primary

point is not to discover the ultimate truth of them as isolated objects. The point is survival and success with systems, in a life immersed in and embedded in systems.

Since its introduction in 2004, our notion of systems intelligence has proven useful in consultative and educational contexts. Radically different audiences find it intuitive. As a wide-ranging and readily applicable concept various kinds of people find the notion useful when structuring and conceptualising one's own actions and human behaviour in general. By introducing the term to the general public, we hope to have contributed, if in a modest form, to what William Oakeshott called "conversation of mankind".

As a theoretical construct, the concept of systems intelligence has already been applied to a number of fields and themes as diverse as leadership, productivity, architecture, dialogue, expert interaction, mergers and acquisitions, decision making, environmental conflict resolution, Goldratt's theory of constraints, the Sun Tzu, pedagogy in schools, emotional and social intelligence, forgiveness, the collapse of Enron, new value creation, communication, collaboration, and Ralph Stacey's theory of organisations. This work is continued in the current volume where the systems intelligence perspective is brought to illuminate and into a dialogue with such phenomena as philosophy for managers, David Bohm's theory of thought, emotions and decisions, the sociological affect control theory, Alexander's view on architecture, homiletics, food, the professional growth of a European champion ice skater, usability, infant research, facilitation mastery and the intersubjective systems theory of Stolorow, Atwood and Orange. Even if some of the articles presented in this and previous collections present only some first steps towards more scholarly studies, we believe the wide range of themes demonstrates the overall usefulness of the systems intelligence perspective. They hopefully encourage similar studies in the reader's own field of expertise and context of experience.

The systems intelligence initiative is somewhat unusual as a theoretical contribution because it seeks a broadband effect across disciplines as opposed to a narrowly definable impact on some particular established field of study. It is like a beam of light that hopefully brings to focus aspects of phenomena that more traditional theories and approaches overlook.

One distinctive characteristic of the systems intelligence approach is the way it seeks to integrate the scientific and humanistic traditions in its foundations.

As an outgrowth of systems thinking, the systems intelligence approach owes much to the rationalistic tradition that focuses on objectivistic modelling methods when approaching systemic phenomena. Often formalistic and modelling-oriented, at one extreme positivistic, this objectivistic tradition seeks to organize and predict, command and regulate the phenomena it describes. It is excited about order and regularity. As an approach to rationally driven impact, it calls for studies that investigate rigorously into the true nature of things. Centre stage is given to modelling and representation. The development of exact discourses appropriate for the presentation of such models is perceived as a primary objective.

All this is fine as far as it goes, but carries a hidden assumption according to which a good model automatically induces intelligent and productive action along the lines identified by the model. This intellectualist bias, a kind of theoretician's credo, is one of the chief reasons why "few organisations adopt systems thinking"

(Russell L. Ackoff), in spite of the tremendous amount of intellectual capital that has been invested into systems thinking and in spite of the demonstrable merits of that approach.

While recognising the merits of modelling and rigorous representation, the systems intelligence approach does not want to fall into such a trap of modelling. Even more important than to learn to model processes that work, is to generate processes that work. For the systems intelligence perspective, action is primary. Improvement is primary. It takes seriously the fact that objective knowledge is often not forthcoming, and yet people may need to act. Indeed, people may act intelligently even in the absence of objective knowledge and without adequate representations of the holistic structures with respect of which the action takes place. Clearly such action is evolutionarily fundamental, constantly part of the human engagement with her environment, and should be taken seriously by students of action, leadership and improvement. This is what the systems intelligence approach aims to accomplish.

As a result, the systems intelligence approach amounts to an extension of systems thinking and other objectivistic modes of thinking. It recognises the significance of the sensitivities-based, "soft", subjectivistic and first-person -related aspects of the human endowment as fundamental to the human systemic engagement with her environment. This is the realm of life most extensively studied in humanities, in social sciences and in the arts.

While rationalistic traditions of thought have often overlooked the significance of the realm of subjective sensibilities, the systems intelligence approach seeks to make use of them. Systems intelligence in humans is a from-within drive that relates the subject to objectivities but does not limit itself to what is objectively available only. It amounts to an art of life that combines the subjective and the objective in real time and in the midst of evolving processes and actions. When facing the gulf that separates the natural science and mathematics inspired objectivism from the humanities and the arts inspired approaches to human affairs, systems intelligence chooses integrity.

Engagement in the world is an evolutionary necessity. Seeking out processes that work is an evolutionary must. Giving descriptions for all that is not. But increasingly academic thinking has focused upon descriptions and upon the analysis of the models that have emerged as such descriptions. This objectivistic bias has led scholars to bypass many of those human capabilities we wish to highlight through the lens of systems intelligence.

Selected Readings

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CHAPTER 1

Philosophy for Managers: Reflections of a Practitioner

Esa Saarinen

THE AIM OF THIS ARTICLE is to describe the significance and key challenges of philosophy for managers as perceived on the basis of a particular understanding of philosophy and my personal experience as a practitioner.[*]

The paper will be more visionary than argumentative. I recognise there are important alternative approaches but I will not engage in detailed analysis of them.[1] Drawing heavily on my own experience, the paper will present an outline and meta-philosophy of philosophical practices that have proven useful in actual interface with practising managers.

I have worked extensively with businesses since the early 1990s giving up to a hundred lectures per year and continuing. The primary working format has been that of a lecture with the occasional back-up of one-on-one discussions. Along with smaller companies such as Marimekko and Ensto, my most significant interface with managers has taken place with Nokia over the course of the years that transformed the Finnish company into a global leader of its industry with an astonishing market share of 35 % and more in mobile phones. This collaboration has involved hundreds of hours of lectures and seminars and extensive discussions with many of the senior managers.

My philosophy for managers has emerged out of a desire to develop a highly communicative philosophy of human flourishing for the benefit of people irrespective of their backgrounds. From my point of view, managers are human beings and should be approached as such. This means that in the context of my philosophical lecturing, managers are often part of a bigger group mostly consisting of non-managers.

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[*]In preparing this paper, I have greatly benefited from discussions with Prof. Raimo P. Hämäläinen, President and CEO Matti Alahuhta, Mr. Petri Lievonen and Mr. Ian Marson.

[1]Groundbreaking works include those by Peter Koestenbaum in his *The Inner Side of Greatness* (originally published in 1991) and other writings and activities (Koestenbaum 2002, 2003, and Koestenbaum and Block 2001). The counseling and therapeutically oriented approaches as elaborated in works such as Marinoff (2002), Raabe (2001), and Schuster (1999) are also important for philosophy for managers, as is work on business ethics like Maclagan (1998).

Among my philosophical practices, the effort that I personally value most is a weeklong seminar on the philosophy of life, self-leadership and related themes held in Paphos, Cyprus, and called "the Paphos Seminar". The seminar has run since 1995, with 29 seminars held by the end of 2007, and with over 2000 participants, managers and non-managers, many of them repeatedly.

My fundamental conception is that the benefits of philosophy for managers emerge from the "in-between" of philosophy and managerial life. They are applied in nature, involve transformative dimensions, require seamless integration to managers' attitudes, perspectives, and actions, and should be judged on their merits in the actions and practices that result.

As I see it, philosophy for managers should benefit the manager in terms of:

1. Self-Leadership

2. Understanding Wholes

3. Activity in Complex Environments

The pedagogy of philosophy for managers, and the research supporting that pedagogy, should aim at increasing the manager's skills and abilities in these three focus areas, in a way that can readily be translated into actions.

In Search of the Bigger Picture

On a general level, philosophy is the art of thinking and its chief instrument is reason. Philosophy for managers seeks to strengthen the art of thinking and the instrument of reason in managers.

My interpretation of philosophy is not of one clearly identifiable discipline with a single core. There is in philosophy "a mysterious flame" that defies scientific, once-and-for-all, objectifying characterisations.[2] Philosophy is therefore fundamentally multi-faceted and its borders are vague.

In reaching out to managers, philosophy activates a multidisciplinary and context-sensitive, connectivity-seeking and multi-methodological, multi-layered and polyphonic discourse. It seeks to operate across paradigms – often joyfully and outrageously – covering existentially, pragmatically and humanly fundamental aspects of the life of a manager with energy, excitement and a feel for the relevant.

If the instrument of change in philosophy is thinking, the goal of that change is an improved, enhanced, better life.[3] Philosophy struggles to foster *the build-up of the good life*, indeed excellence in life, and that *through the realm of thinking* – using words, concepts, questions, challenges, reasonings, ideas, associations, comparisons, and other instruments of the verbal and conceptual dimensions. It searches the universally valid (in the sense of say PLATO's rationalism or DESCARTES' foundationalism, or scientism of a QUINE), while at the same time tuning in to the personal (SOCRATES, NIETZSCHE, POLANYI, SARTRE).

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[2]I am here adopting a phrase from Colin McGinn, who in his forceful *The Mysterious Flame* (1999) argues that we can never "know" consciousness.

[3]For discussions pertaining to this conception of philosophy, see Hadot (2002), Nehamas (1998) and Shusterman (1997).

The majesty of philosophy incorporates the right, even the duty, to *study the bigger picture*[4] – including the bigger picture of a small picture, a locality, that of an individual human being in the midst of her immediate context. In this endeavour to figure out the bigger picture, freedom looms large, reaching out if needed to staggering dimensions. Philosophy stops at nothing. It is ready to fly out to the limits of conceptual reason and beyond with imagination, relying on words. Unlike other sciences – assuming that philosophy is a science – philosophy does not waver even when facing the unknowable, the dimension of the speculative. The margins, the peripheral count and constitute a potential for a philosophy in search of the essential.

This perspective stresses philosophy for managers as a quest for the bigger picture, with sensitivity to the contextual and peripheral, in the service of the essential. The bigger picture could concern the overall structure of the market, or market economy, or patterns of innovation, or key prospects in the long run, or one's personal work-life balance. Philosophy helps the manager in the challenge of figuring out what cannot be decided by facts and information. Philosophy for managers is an ally for the manager in the midst of "the elusive phenomena" (using the apt phrase of F. J. ROETHLISBERGER).[5] Philosophy is a sparring partner for the manager in her mental and conceptual realm, a force that helps her to make better use of the "mysterious flame" within herself in the dimensions of her thinking and self-leadership. If "bad management theories are destroying good management practices", as SUMANTRA GHOSHAL forcefully argues,[6] it is up to the manager to challenge her mental models and implicit theories, and in that process a philosopher can make an invaluable contribution.

I perceive philosophy in terms of philosophers, and management in terms of managers. This means focusing upon human beings that are capable of reasoning and thinking with individuality, courage and insight, and who *operate* with ideas and *create* in a space that is conceptual and often qualitative, personal, and visionary. The point is to reinforce that dimension.

Philosophy has an immense contribution to make to managers in their dimension of thinking, particularly when the manager enters, as she increasingly

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[4]"The study of philosophy is a voyage towards the larger generalities." (Whitehead 1985, p. 10). The opening chapters of Whitehead's work comprise some of the finest meta-level characterisations of philosophy that I know.

[5]Roethlisberger, in his autobiographical book *The Elusive Phenomena* (1977), describes how he was instrumental in getting "Organizational Behavior accepted as one of the formal areas of instruction and research at [Harvard Business] School" in the early 1960s. Roethlisberger's reflections are entirely relevant today for a philosopher for managers. "I feel that the latent gist of my communication was to this effect: 'Dear Mr. Manager, you dumb cluck, don't you see what an important guy you are? Why don't you 'wise up' to your distinctive competence and see that you have a higher function to perform than just making money and profits? . . . "' (p. 3) It is in the service of understanding of the manager's "higher functions" that philosophy for manager can provide a major contribution.

[6]Ghoshal (2005) first quotes John Maynard Keynes' famous words to the effect that "The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood", and then nails down his own position: "Many of the worst excesses of recent management practices have their roots in a set of ideas that have emerged from business school academics over the last 30 years." – Ghoshal's article should be required reading for any class on Philosophy for Managers, along with Hayek's Nobel speech (1974).

does, the realm of the unknown, the unclear and the unfolding. While much of current professional philosophy focuses upon the certain, philosophy for managers directs attention to contributing in the presence of the uncertain. More than knowledge-building, philosophy for managers is about the on-going vision-building and perspective-building.

As in art, so in philosophy and in management, personal engagement is of the essence. Each manager needs to think her thoughts for herself. Philosophy for managers wants to enrich that ongoing process of constant renewal. The point is to engage the manager in dialogues of enrichment, renewal and uplift, in an effort to help her internal processes of understanding (GADAMER) as driven by the ideals of an *insights-rich life*. This dialogue – the process of mental building-up, the education of the mind (DEWEY, JAMES), edification (RICHARD RORTY)[7] – is the true context of philosophy with respect to which philosophy for managers must find workable, fresh, operatively explosive methods, insights and actions to fit the demands of the situations to hand.

In Search of Style that Works

"The medium is the message" is one of the most often-quoted one-liners from a thinker at an academic institution in recent decades, yet it is not often brought into focus in philosophical discussions.[8] Academic philosophy might enjoy its narrowed-down practices, but philosophy for managers must turn to the real world.

In the real world, and in a real-world philosophy, style is an integral part of the content. This is a world in which someone like MARSHALL MCLUHAN is very much a philosophical thinker. Unique, startling, hope-creating, questions-intensive, suggestive style in itself is a philosophical statement. There is no "view from nowhere" (as THOMAS NAGEL aptly put it),[9] and the neutrality of methods and styles can only be declared by a philosopher who, disguising her meta-level choices, proclaims the omnipresence of an unbiased meta-level super-truth. Long live

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[7]The work of Richard Rorty is fundamental in the challenge it sets for the dialogue between philosophy and non-philosophy. See Rorty (1979) and subsequent works. The important interviews gathered in Rorty (2006) are a key source of inspiration. Rorty is one of the few American philosophers to have realised the creative potential of the interview format. For another inspiring philosophical interview-book, see Rothenberg (1993), the timely book of conversations with Arne Næss.

[8]For a discussion of some McLuhanian themes and of philosophy as media philosophy, see Taylor and Saarinen (1994). Mike Sandbothe's work on radically interventionist media philosophy breaks new ground for applied philosophy and is one of the most exciting openings in the arena. See Sandbothe (2005) and (2008). For a scholarly discussion of some of the key themes, see Sandbothe and Nagl (2005).

[9]Nagel's writings are exemplary understandable and deep. For a manager, I think it will be useful to ponder on his position, according to which "Objectivity is a method of understanding. ... Every objective advance creates a new conception of the world that includes oneself, and one's former conception, within its scope; so it inevitably poses the problem of what to do with the older, more subjective view, and how to combine it with the new one. A succession of objective advances may take us to a new conception of reality that leaves the personal or merely human perspective further and further behind. But if what we want is to understand the whole world, we can't forget about those subjective starting points indefinitely; we and our personal perspectives belong to the world." (Nagel 1986, pp. 4–6)

the literary philosophical genius of a SCHOPENHAUER, Nietzsche or BERGSON,[10] or, closer to us, the deep humanism and literary brilliance of ISAIAH BERLIN and GEORGE STEINER,[11] the witty eloquence of ALAIN DE BOTTON[12] or ANDRÉ COMTE-SPONVILLE[13] or the delightfully outrageous PETER SLOTERDIJK[14]. There is no reason to look down on "scientific", "formal" or scholarly philosophy, or the debates of academic philosophy, but the fact is, typically they fail to yield insight for a practising manager.[15]

Suppose we take *the urge to matter* as a cornerstone of effective action in philosophy. Suppose the point is to enrich the now-horizon of a practising manager with something that counts. Suppose we start with character – a manager's own character.[16]

Socrates' integrity does command managerial respect. In the aftermath of Socrates, surely the insights of Plato's dialogues, EPICTETUS' notebooks, those of MONTAIGNE, will yield insight to anyone that is willing to read. For a manager's self-leadership and character-building, philosophical literature is indeed a treasure chest. Particularly valuable is the wealth of material provided by the Eastern

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[10]In his polemical introduction to *The Future of Philosophy* (2004), Brian Leiter, while siding unashamedly with the academic tradition of philosophy in its Anglo-American form, still acknowledges that "Prototypical non-analytic figures, like Schopenhauer and Nietzsche, are far clearer (and more beautiful) writers than many of the dominant figures in Anglophone philosophy today" (Leiter 2004, p. 12).

[11]Berlin's writings yield to no-one in their depth and insight. See e.g. Berlin (1953, 1981, 2003), and the marvellously inspiring *Conversations with Isaiah Berlin* (Jahanbegloo, 1993). I rank George Steiner's writings as some of the most uplifting philosophical discourse in our times. See e.g. Steiner (1997, 2003). I find Steiner's emphasis of the significance of the oral dimension as fundamental to my own philosophical practice.

[12]As a writer and advocator of what I would call living philosophy, of the kind relevant for philosophy for managers, de Botton is a towering figure. See de Botton (1997, 2000, 2005, and 2006).

[13]See in particular Comte-Sponville (2001).

[14]Sloterdijk's *Critique of the Cynical Reason* quickly became the best-selling philosophical prose work in Germany after the Second World War. In spite of its stylistic and intellectual brilliance, the book is routinely bypassed in academic discussions.

[15]This is not to blame a philosopher if she fails to inspire a manager. There are number of culturally enriching ways a philosopher, like any cultural worker, can contribute. My point is that contributing in ways relevant for philosophy for managers is one of the forms of enrichment we should acknowledge. Indeed, it is an arena that cries out for recognition in a world that desperately needs responsible, prudent and wise leadership. The Socratic call for a self-examining life *is* there in management and leadership. We should recognise this domain of contribution along with its special features in order to contribute more effectively. Personally I hail Charles Taylor's *Sources of the Self* (1989) and *A Secular Age* (2007) as landmarks of brilliant synthetic philosophical thinking in our times. Yet the challenge remains, to make these works explosive as philosophy for managers.

[16]Notice works such as Peterson and Seligman (2004) that approach character strengths from a psychological perspective. It is clear that philosophy for managers that strives for relevance in a manager's character building needs to enrich itself by empirical research such as reported in Peterson's and Seligman's monumental work. For some relevant managerial discussions, see Badaracco (1998) and Brownell (2006). A key philosophical work on virtue ethics for me is MacIntyre (1981).

traditions[17]. The challenge of philosophy for managers is to open that treasure chest and cut its diamonds for the context of today.

I am not value-free here, having left behind the ideal of neutralism. Certain choices have been made. I do not see how my lectures or seminars with managers would have been productive and rewarding without those choices. Philosophy for managers, or applied philosophy, is not value-free. Certain things count more than others because not everything will enhance the prospects of a good life. This in itself is hard to quantify, although undeniable. Where the possibility of human flourishing is taken seriously, as I think it should be in a positive philosophical practice targeted for relevance for managers, where the endeavour of positive psychology[18] and positive organisational scholarship[19] is taken into focus, there philosophical pedagogy and methodology should resonate not only with content, abstractions, and arguments. It should address tough questions of impact and usefulness.

In addressing questions of influence, the philosopher for managers will have to choose her colours because not all causes are just. Personally I think that the philosopher for managers should not perceive herself as a coach for performance only but should opt for human flourishing, dignity, freedom and justice. She should be aware of the force of bad ideas, and of well-intended good ideas in bad hands, as well as of the temptations of power, vanity and influence along with human abilities in self-deception. She should, in short, study PAUL JOHNSON's disturbing *Intellectuals* and ANTHONY READ's equally alarming *The Devil's Disciplines*.[20] Not all influence is good influence, and yet we must try. The point of philosophy for managers is to generate influence for the sake of the good. There is no a priori conflict here. On the contrary, as the Nobel laureate EDMUND S. PHELPS has argued, in his vision for "good economy", "the humanist conception of the good life takes us a long way toward a justification for society's support of an entrepreneurial, innovative economy."[21]

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[17]For Chinese classics, see Chan (1963); on Zen, see Watts (1957), Cleary (1989), Suzuki (1970); for a scholarly exposition of classical Indian thinking, see Radhakrishnan (1929). Hanh (1995) is a beautiful discussion of Buddha and Jesus, a book some of my senior executive friends have found particularly illuminating. Other books of the Eastern tradition with managerial relevance include Rinpoche (1992) and Dalai Lama and Goleman (2003). For an excellent elaboration of Buddhist ideas from a Western perspective, see Epstein (2001). Michiko Yusa's *Zen & philosophy: An intellectual biography of Nishida Kitaro* is a touching account of the life and thinking of perhaps the greatest of Japan's 20th century philosophers.

[18]Seligman and Csikszentmihalyi (2000), Snyder and Lopez (2002, 2007), Keyes and Haidt (2003).

[19]Cameron, Dutton, and Quinn (2003), Dutton and Ragins (2007).

[20]The managerial challenges of Hitler's empire were tremendous. In late 1939, while touring the Jewish ghetto in Lodz, Poland, Goebbels "got out of his car to make a thorough inspection. 'Indescribable!' was his disgusted reaction. Echoing Hitler, he wrote in his diary: 'These are not human beings any more, they are animals. So this is not a humanitarian task, but a surgical one. One must operate, and radically. Otherwise, Europe will be destroyed by the Jewish sickness.' " (Read 2003, p. 612.)

[21]Phelps (2007). See also Phelps (1997). Phelps' perspectives fit particularly well with the overall ideas I am putting forward here. "I want to argue that the Aristotelian ethic – Aristotle on happiness, the pragmatists on problem-solving and capabilities, and the vitalists on adventure and exploration – played an *essential* part in a huge development in our economic history." (Phelps 2007, p. 16)

For me personally, it is particularly relevant to use philosophy to foster the manager's existential narrative and personal *story* (JEROME BRUNER[22], HOWARD GARDNER[23]). In the dimension of Self-Leadership, philosophy for managers should help the manager to reach towards the "Reflected Best Self"[24] and inspire her to develop her *life as a work of art* as well as the fostering of her *care of the self* (MICHEL FOUCAULT[25], PIERRE HADOT[26]). And the point is, philosophy is rich in its resources to do that.

Philosophy for managers serves the cause of the good life, presents itself as a form of a life-enhancing positive philosophical practice, and amounts to an effort of the mind to reconnect through humanity with the fundamental struggles of another human being – a manager.

Philosophy for Managers as Philosophy of Life

For me, the core of philosophy for managers is the philosophy of life. It is here that the three areas of self-leadership, understanding wholes, and activity in complex environments are integrated and brought into focus. The philosophy for managers must have dynamic impact on all these three critically important arenas of the manager's life.

There are casualties. The first casualty is much of academic philosophy, along with intellectual brilliance for-its-own-sake[27]. Academic philosophy in its various formats will not be of much use for philosophy for managers because it does not communicate with managers. Yet in the philosophy for managers the need to be understandable is imperative.

On the positive side, we can acknowledge style-intensive, verbally reforming and personal thinking *in philosophical spirit* as part of the vital canon of philosophy

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[22]Bruner is a tremendous psychological thinker whose work is fundamental to philosophy for managers. On the significance of the narrative, see in particular Bruner (1986, 1987, 2002).

[23]See Gardner and Laskin (1995) for a study of the significance of stories for leadership.

[24]Roberts et al. (2005).

[25]In Foucault's extensive bulk of work, perhaps the single most informative text on this theme is his interview with Paul Rabinow and Hubert L. Dreyfus (published in *The Foucault Reader*). In that interview, Foucault states among other things that "What strikes me is the fact in our society, art has become something which is related only to objects and not to individuals, or to life. That art is something which is specialized or which is done by experts who are artists. But couldn't everyone's life become a work of art? Why should the lamp or the house be an art object, but not our life?" (*The Foucault Reader*, p. 350). For some other important Foucault interviews, see Foucault (1980, 1996). Like Sartre before him, Foucault developed interviews brilliantly as a cultural form for expressing philosophical insights.

[26]Hadot's *What is Ancient Philosophy?* (2002) is particularly powerful here. See also Hadot (1995).

[27]I shall not enter in to the meta-philosophical discussion of the general merits and demerits of the institutionalization or academization of philosophy. Some of the valuable contributions in this area include Hamlyn's warmly-tuned (1992), Calhoun's critical (1997) as well as Collins' astonishing (1998). Suffice it to quote here Hamlyn who notes that "It is not entirely clear what the modern counterpart of Socrates in contemporary society would be, but there are few obvious attempts to fulfil such a role. The result is the accusation that philosophers occupy an ivory tower." (Hamlyn 1992, p. 162) "Above all..., non-philosophers often fail altogether to see the point of the subject." (p. 165).

for managers (for instance: Emerson, Thoreau[28], Barthes, Kundera[29]).
Certainly Dostoevsky and Tolstoy command primary attention as does
Shakespeare. The effort is one of *moral literacy*[30] and the renewal of speech
and metaphors (in the sense of Lakoff and Johnson[31]), the creation of a space
for new words and concepts, is of course at the core of philosophy (as stressed
by Deleuze and Guattari[32] and others) and it is clear that philosophy for
managers cannot be content with the stingy discourse of academic philosophy
only.[33] A personal way forward will involve personally inspiring discourse (as
Kierkegaard in particular realised, along with Nietzsche, or with Pascal).
That is the personally tuned pathway of human dignity that the philosophy for
managers points to, as encouraged by the ancient greats.

More than anything, philosophy calls out to managers to take their thinking
seriously – much more so than what is required by the immediate professional
challenges she may face. Philosophy for managers is inspiration for the manager
to elaborate on *the voice and subtleties of her own thinking*. It is an invitation
to think beyond the obvious and beyond the immediate task-list. Philosophy for
managers is an act of empowerment through the realm of thinking, a celebration
of that tremendous human endowment that easily gets narrowed down to tired
patterns and short-sighted perspectives.

The radical aspect of philosophy for managers, from the point of view of
academic philosophical practices, is the way it encounters the manager as an equal.
Socrates on the square in the small town of Athens having a conversation with
a war-hero, as opposed to a fellow-philosopher: this is the paradigm. The point
here is to acknowledge what Socrates does *not* do. He does *not* dismiss his fellow-

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[28]Stanley Cavell stresses the significance of Emerson and Thoreau, "the most underrated
philosophical minds...to have been produced in the United States" (Cavell 2004, pp. 12–13).
All serious students of the philosophy for managers should explore Cavell's "Introduction" to
his characteristically original *Cities of Words* (2004) in which he outlines his view of "moral
perfectionism", philosophical analysis of "moments of crisis", "of the sense of a demand that
one's life, hence one's relation to the world, is to undergo change", and of "claims for a way of
life, for a transformation of one's life" (pp. 13–14).

[29]For the philosophy for managers Kundera's emphasis on "the spirit of the novel" (Kundera
2005) concerning the specific, the unique, the individual, and the relational, is highly suggestive.
It is often the abstractionism and non-contextualism of philosophy that renders philosophical
theorizing useless for practising managers. My own practice is strongly focused on making
philosophical reflection contextual and thus embedded in the manager's life. My philosophical
approach for managers is essentially a re-contextualization of philosophical practice in the
realities of the manager. An excellent analysis of the pitfalls of decontextualized forms of
thinking is to be found in the important work of Stolorow, Atwood, and Orange (2002).

[30]Again I am using a phrase of McGinn's. See his highly readable (1992).

[31]Lakoff and Johnson (1980) and subsequent works.

[32]Deleuze and Guattari (1994): "The philosopher is the concept's friend; he is potentiality of
the concept. ...philosophy is the discipline that involves *creating* concepts." (p. 5)

[33]In my own practice, I have chosen to dispense with academic jargon entirely. Instead, I
employ words that many find colourful, associative, inspiring and (often) funny. The discourse
might refer to "007 principles", "non-rose-buying", "the upscale register", and to "systems
of holding back". The words I use are not presented as discipline-tight concepts with one
from-above defined correct interpretation. They serve as a kind of musical or suggestive function
in the currency of speech I struggle to develop. Individual expressions work in the service
of the whole and at the same time help to constitute it. The whole operates as an intensive
thinking-experiment in an unfolding living present. For a discussion of this kind of philosophical
lecturing as a philosophical practice, see Saarinen and Slotte (2003).

Athenian on the basis that his issues are not "deep", "serious" or "intellectual" enough. Socrates is not out there to find a fellow-expert of the eternal. Philosophy for managers picks up the Socratic call for *a dialogue with a non-philosopher in the living present*[34] with the intent of a mutually co-created going-forward. The aim is to increase the understanding of oneself, of the complexities of the situations, and the gestalts of the wholes in which one is operating.

The way I perceive it, philosophy concerns everyone and concerns itself with everyone. Philosophy *is* a concern – *an on-going concern to engage in* rather than a subject to be looked on and learned. This fundamental core objective of philosophy, its *open-door commitment to a dialogue*, is difficult to synchronise with the policies of power at the institution of the academia. Increasingly, since the Second World War and in the course of what MARK C. TAYLOR calls hyperspecialisation[35], the popular way out of this dilemma has been to give up *the ancient promise of philosophy* for the benefit of some intellectually intriguing but alienated-from-life (in the sense of young MARX, MARCUSE) super-symbol management studies as the true task of philosophy.[36] No doubt the motivation here is political and economic, an effort to appear respectable along with sciences and to present a "pretence of knowledge" (as F. A. VON HAYEK put it in his powerful Nobel lecture).[37] Yet the challenge is to maintain philosophy's magnificent dialogic, life-enhancing undertone, to do justice to both its nobility[38] and commitment to the everyday. We will have to realise that reality is the true arena for us as philosophers, like for Socrates or for Sartre. There cannot be any significant philosophy for managers outside the realm of the real.

In philosophy for managers, thus conceived, even more important than new knowledge is therefore the activation of thought and personal insight for the implementation of action. It turns to people on *their* terms and from the point of view of a life in the mode of becoming.

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[34]Daniel N. Stern writes, with characteristic forcefulness, in his insightful study on the present moment, "It is remarkable how little we know about experience that is happening right now." (Stern 2004, p. 3). Stern's work articulates a perspective that is essential to appreciate for a philosopher for managers. The *tense* of philosophy for managers is indexed to the present, unlike in paradigmatic content philosophy that aims at eternal truths.

[35]Mark C. Taylor, in his important *After God*, writes: "Though rarely acknowledged, the interpretative perspectives of many self-professed avant-garde critics actually reflect and reinforce many of the most conservative aspects of the contemporary research university, where hyperspecialization produces scholars whose critical vision remains limited." (Taylor 2007, p. xv).

[36]Shusterman's *Practicing Philosophy* (1997) presents a powerful demonstration of the need for "extending the conception and practice of philosophy beyond the borders of professionalized academic establishment." (p. xi). By a careful and scholarly rich discussion Shusterman presents the key aspects of "the philosophical life" particularly as illuminated by the writings and lives of Dewey, Wittgenstein, and Foucault.

[37]Hayek (1974) was discussing economics, but the perspective applies with full force to academic philosophy. After stating that "as a profession we have made a mess of things", Hayek explains: "It seems to me that this failure of the economists to guide policy more successfully is closely connected with their propensity to imitate as closely as possible the procedures of the brilliantly successful physical sciences – an attempt which in our field may lead to outright error." "I want today to begin by explaining how some of the gravest errors of recent economic policy are a direct consequence of this scientistic error."

[38]For me, that tone of nobility is magnificently exemplified in Charles Taylor's *A Secular Age* (2007), in the writings and interviews of the late Richard Rorty, and in those of Sir Isaiah Berlin.

Philosophy for Managers as a Living Act

I believe the key call in philosophy for managers is to re-engage with the vibrant possibilities of *the spoken, face-to-face language.*

This call is radical, given the dominance of the written word in academic philosophy. Yet I think it is absolutely critical for philosophy for managers to go beyond the written word. We should follow the steps of Socrates and proceed in the spirit of "School of Athens", as depicted in Raphael's famous painting with that name (where no teaching, among the dozens of people, despite the presence of Plato and Aristotle, seems to be taking place at all). Philosophy for managers should not yield to the temptations of the academic discourse that suggests the necessity of an abstractionist metaphilosophy along with the view that the whole of "meaning" in philosophy can be coded in written words.

Philosophy for managers takes seriously the fact that the best known philosopher of all time did not write a word. I think it is essential to recall that 2400 years after Socrates, Ludwig Wittgenstein was a professor at the University of Cambridge, giving lecture after lecture without anybody knowing in advance what the subject of the lecture would be.

And those who attended Heidegger's lectures and seminars have insisted that an essential part of his philosophy was lost when reduced to the written form (although ingenious in its own right).[39] As *the currency of a thought* is lost, something essential of *the philosophical grandeur, energy and meaning* is also lost.[40]

We should acknowledge the fact that there is a "where" and "how" in philosophy and in philosophy for managers, not only a "what". I would go so far as to claim that the "where" and "how" are even more fundamental to the operation of the philosophy for managers than the "what".

My own experience certainly points to the significance of context-creativity as opposed to content-delivery as the cornerstone of successful philosophy for managers. Whatever value there has been in my own efforts in philosophy for managers, they belong to that dimension that highlights *the event- and process-generating nature of a vibrant, life-enhancing philosophy.* Philosophy becomes something experienced, something subjectively attuning, something that shines through or glows, rather than something that sticks out as a clearly identifiable list of themes. The philosopher's content-command becomes secondary, her handling of the interface with the manager, along with sensing the manager's subtle movements of thought, become primary. This means that emotions and affects are not viewed as distractions, but embraced as allies. Body consciousness becomes critical as well.[41]

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[39]Steiner (1989), who refers to Löwith, Gadamer, and Arendt.

[40]The concept of "energy" is not often discussed in connection of philosophy. One exception is Lévy in his impressive Sartre-book (2003). A representative paragraph: "In short, Sartre was the only one in his generation to invest his energies in all genres. He was the only one to occupy the territory, all the territory, available. He was the first, as he would say later, in a magnificent formula, to 'write in so many languages that things pass from one language to another.'" (Lévy 2003, p. 46.)

[41]For a groundbreaking discussion of the "body consciousness", see Shusterman (2008).

Methodologically and pedagogically, perhaps the most striking aspect of philosophy for managers comes out in the idea that philosophy for managers *should not try to teach managers philosophy*. The point is not to add new philosophy files to the manager's internal hard disk. The point is to make them re-connect with the philosophical contents they in most cases already have. Thus all the references in this article are of secondary value only, and do not represent what happens in my own philosophical practice with managers. Everything I refer to in this article is part of my own thinking but the point of my philosophy for managers is not to make the managers think like me but to make them think more like *them*.

I realise of course that academically a philosopher is conventionally perceived as surrounded by colleagues (on the one hand) and by counter-arguments (on the other) through which she is legitimised. The philosopher is thus constructed through the products of her own making, writings, teachings, theories, in short the objects to which she then reduces as a subject. But does not this object-perspective narrow down the philosophy of a philosopher and cut down some of the contributive possibilities of a *living* philosophy? Does it not make philosophy for managers languish, lose its potential to aspire? I believe it does.

The living thinker for the everyday, the philosopher for managers, should realise the fact that she is menaced by the threat of scholarly clichés, by expert-cultural buzzwords, by argumentative sophistry, by conventional and compartmentalised truths, even by intellectual brilliance and especially by reified practices that do not do justice to what the philosophical effort originally was all about.[42] Reality that moves requires thinking that moves. The event of thinking must be *experienced*, like a symphony that only reaches its full glory in a live performance as witnessed on the spot. In the spirit of Socrates, Wittgenstein and Heidegger, we must prepare for the staggering possibility that in the philosophy for managers, and in thinking in the service of a philosophy-of-life, there resides hidden a dismissed legacy of fundamentally noble origin – *speech-based culture* – the powerhouse of human creativity, magic and uplift that demands a face-to-face interaction (LEVINAS[43]) and a living presence in order to fulfil its promise.[44]

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[42]Shusterman's (1997) discussion of Dewey, Wittgenstein, and Foucault is powerful on this theme and supports strongly the overall conception I am putting forward. "Dewey sharply chided his professional colleagues for shirking the duty of bringing philosophy to bear on 'the living struggles and issues of its own age and times,' confining its practice to old academic problems so as to 'maintain an immune monastic impeccability, without relevancy and bearing in the... contemporary present'. ... Dewey insisted that it [philosophy] would recover its true worth (as a life-centered enterprise) only 'when it ceases to be a device for dealing with the problems of philosophers and becomes a method, cultivated by philosophers, for dealing with the problems of men'." (p. 20). Dewey's views are shared by Wittgenstein and Foucault, Shusterman argues, and he concludes: "In short, Wittgenstein's disrespect for mere academic philosophizing stems from a view he shared with Dewey and Foucault, that philosophy had a much more crucial, existential task: to help us lead better lives by bettering ourselves through self-knowledge, self-criticism, and self-mastery."

[43]Particularly useful is the series of radio discussions between Levinas and Philippe Nemo published as *Ethics and Infinity* (1982).

[44]In his insightful Introduction to Sun-Tzu, Roger T. Ames writes: "In contrast with the more static visual language of classical Greek thought typified by geometry, classical Chinese tends to favor a dynamic aural vocabulary, where wisdom is closely linked with communication – that keenness of hearing and those powers of oral persuasion that will enable one to encourage the most productive harmony out of relevant circumstances. Much of the key philosophic

Philosophy for Managers as a Performing Art

As a philosophical practitioner, I consider it fundamentally important that my work facilitates situations of significance for managers and people at large to engage in a *living present and a shared space for emergent, unfolding thinking and attentiveness.*

My main instrument is one of "lecture" which I conceive in terms of experience-as-lived-on-the-spot, a platform for inspiration, insight and personal attunement, and as a co-created space of intense, focused movement of thought. The key instrument is speech – philosophical talking and oratory that are designed to create the context for insights and personal thought-processing.

I do assume that when speaking about the grand themes of life, a philosopher's talking and performance can *live* and be experienced as *alive*, in much the same sense in which aliveness is a key category in the theatre, dance or music. The speech of the philosopher, as a thought-process unfolding in front of an audience, is the invitation to personal creation. The philosopher's challenge is to bring into existence a discursive and holistic art-work that makes the speech alive for whoever is present. In that thought- and experience-directed discursive practice, the philosopher's personal credibility, intensity, and ability to radiate positive energy will play an essential role in co-constituting a platform of mental uplift for the participants to experience and engage in the flow (in the sense of CSIKSZENTMIHALYI[45]) of her own thinking.

Philosophy for managers, at best, can be life-transforming. Yet that transformation is not to be depicted by the speaker, who only provides the context. The direction of the transformation is up to the manager to decide, through the mental processes made more intensive and rich by the facilitation of the philosopher-speaker.

Personally I enjoy relatively large lecture settings (one hundred participants) because the multitude serves an amplifying function. The thinking-experience of each is intensified by the experience of others undergoing their own intensive thinking-experiences, creating a kind of a "ripple effect" through emotional contagion in the lecture setting.[46] People play their thought instruments in the company of others, resulting in an internally experienced concert of thoughts. The philosopher-speaker serves as the conductor of that concert.

In this approach, the philosopher is not a lonely thinker who informs others of her findings. She does not operate from above. Rather, the philosopher is conceived as a subtle and vital connectivity-builder for people in the fundamental experience

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vocabulary suggests etymologically that the sage orchestrates communal harmony as a virtuoso in communicative action." (Ames 1993, p. 55.) This point highlights one of the ways in which philosophy for managers will benefit from the Chinese path of doing philosophy.

[45]Csikszentmihalyi (1990) and subsequent writings. For a review of the flow-related research, see Nakamura and Csikszentmihalyi (2002).

[46]For a study of the Ripple Effect based on empirical findings, see Barsade (2002). The emerging field of emotions and group emotions is highly relevant for the kind of philosophy for managers I am advocating here. For one thing, as Barsade observes, "there are some important differences between emotional and cognitive contagion". (p. 645). Academic philosophers, as experts of ideas, naturally focus on the latter. But I think we should look more closely the former sort of contagion in our efforts to develop workable philosophy for managers.

of thinking-together while each entertains intensively her own thoughts. In other words, a philosopher is an intermediary (Luce Irigaray[47]) who highlights the intangible but vital in-between (Buber). *Communicative subtlety and creativity* and *inspirational abundance* are cornerstones of philosophy for managers which adopts the role of conducting communally created aspiring concerts of thoughts. Improvisational skills become critical,[48] as does her sensitivity to the hints of the audience, personal rapport, and her intuition to guide actions in the performance in productive and spontaneous ways. Along with classics of philosophy, the philosopher for managers will gain inspiration for her work from the practices and experiences of performing artists, along with meta-level writings that conceptualise that arena of human expression.[49]

Thus conceived, philosophy becomes thinking-on-the-spot and a courageous, humble, and spirited effort to unleash the manager's thinking. The philosopher for managers is essentially, not an informer of philosophical themes or contents, but a fellow-thinker who strengthens the internal philosopher-thinker within each manager. As in performing arts such as theatre or music, so in philosophy, the present moment becomes the platform for the creative magic to take place. The philosopher for managers should be a master lecturer, master communicator, master connector, master inspirer – a master interpreter of the subtleties of the human heart and creator of memorable moments. A Socratic midwife with performative brilliance as a key competence of that midwifery. The point is not to deliver content *a* but to make people live through their own experience and thinking – because "working in philosophy", as Wittgenstein once put it, "is really more a working on oneself [die Arbeit an Einem selbst]. On one's own interpretation. On one's way of seeing things."[50]

It should be clear by now that in my view, *philosophy does not reduce to the management of its contents.* Philosophy for managers is not a delivery channel for particular themes. The contents are important but there is more *that is even more important.* Philosophy that is charged for dialogue and for significance to managers' lives seeks resonation and vibrations with energising, life-enhancing productivity. In the field of organised thinking, philosophy aims to be – and should be – a *dissipative structure* (Prigogine[51]) that creates mental maelstroms.

Philosopher as a *performing artist*? Yes. Socrates and Wittgenstein pulled off

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[47]My personal favourite among Irigaray's corpus is Irigaray (2004).

[48]For a useful discussion of improvisation in organisational settings, see Weick (1998). Weick makes much use Berliner's (1994) authoritative study of improvisation in jazz. Improvisational metaphors are highly useful in the kind of live philosophy I am here advocating. Another illuminating perspective on performative philosophy is provided by Bradford P. Keeney's (1990) work on "improvisational therapy". Keeney argues for an approach in therapy that is in many ways analogous to what I am here proposing for philosophy: "Imagine psychotherapy being contextualized in an academy of performing arts as a discipline comfortably related to theatre, music, dance, and the rhetorical arts. ... The most dramatic shift imaginable in the field of psychotherapy is to free it from the tight embrace of medicalism and scientism and connect it to the creative wellsprings of the arts." (p. 1)

[49]Some of my own favourites: Auslander (2008), Berliner (1994), Bernstein (1976), Bogart (2001), Bowen (2003), Brendl (2002), Gordon (2006), McCartney (1998), Weston (1996). An excellent book to start with is Godlovitch's *Musical performance: A philosophical study* (1998).

[50]Wittgenstein (1980, p. 16e).

[51]Prigogine (1996) and Kondepudi and Prigogine (1998).

this role with dazzling results. Philosophy must live, not stagnate in its own truth – a view that becomes dramatised in the letter Sartre wrote to decline his Nobel Prize for literature.[52] But, as the living philosopher takes distance from contents and *in abstracto* disciplinary measures, up comes the horizon of implementation. From an academic and scholarly viewpoint, this is followed by a threatening and perhaps bizarre-looking emergence of the impermanent, the uncertain, the non-epistemic, the sensitive, the intuitively-grasped, the personal, the style-bound[53], non-discursive[54], and even non-represented.[55]. No longer able to rely on clear and distinct ideas or on what can be grounded on knowledge, rejecting mind as a mirror of nature (Rorty), the philosopher for managers finds herself in the midst of a highly personal and moral task. The philosopher is challenged to unleash her vitality and effectiveness in service of ideals she believes in, losing universality perhaps but regaining life – re-establishing a living connection to philosophy as depicted in DAVID's magnificent painting of the death of Socrates, a connection to the upscale-as-approached-through-passion. The moral imperatives of philosophy are back.

This means that philosophy for managers, a form of dignity-charged philosophy, should be uncompromising in its courage to speak in qualitative and everyday terms. We need to start to use proudly expressions such as "life", "uplift", "flourishing", "energy", "love", "emotion", "humanity". Indeed, philosophy for managers and applied philosophy in general must talk about life with the intention of making life *live* – it must create more life, more flourishing life. It must initiate and inspire thinking that is immersed through and through by the *sense of life* (in the sense articulated most forcefully by CHRISTOPHER ALEXANDER in his groundbreaking work[56]). Here, phenomenological instincts – and the recognition of emotional truths – feed my view that the movement of thinking needed in philosophy for managers cannot be cut off from the non-rational, non-verbal, tacit and implicit dimensions of our human endowment (as emphasised e.g. by the

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[52]"The writer must refuse to let himself be transformed by institutions, even if these are of the most honorable kind, as is the case here." For a description of the dramatic and also humorous incidents surrounding Sartre's decision, see Cohen-Solal (1987, pp. 444–449).

[53]In his *Mastering the Art of Performance*, Stewart Gordon writes: "...the ability to turn in a successful performance stubbornly resists codification, and to some extent remains a mercurial art. After decades of study and research, the components that make up successful performance remain elusive, differing not only from individual to individual but also from circumstance to circumstance." (Gordon 2006, p. 7).

[54]See Shusterman (1997) for an illuminating discussion of the non-discursive. As part of his creative effort to break new grounds for philosophy, Shusterman observes that "to philosophy's image as an essentially linguistic discipline devoted to pure *logos*, the nondiscursive somatic dimension of life poses a challenge." (p. 31). It is clear that any adequately working philosophy for managers will have to account for this critically important dimension in which much of my own practical work among managers have taken place.

[55]Rorty has analysed powerfully the over-excitement of Western philosophy on representations. According to the view that he rejects, "philosophy's central concern is to be a general theory of representation" (Rorty 1979, p. 3). I completely agree with Rorty that we should look for philosophy beyond representations. Indeed the kind of approach described here will be possible only if we step beyond a representationalistic view of doing philosophy. For a discussion of Rorty along these lines, see my (forthcoming).

[56]See in particular Alexander's superbly impressive four-volume *The Nature of Order* series (2002–2004) and also Alexander (forthcoming 2008) as well as his Schumacher lecture (Alexander 2004b).

BOSTON CHANGE PROCESS STUDY GROUP[57]). On the contrary, living applied philosophy for the everyday should be developed *systems-intelligently* – with an acute eye and heightened sensitivity to the holistic and relations-intensive aspects of the situation at hand, and to the hidden potentials of the context as a humanly-tuned system.[58] We must acknowledge emotions as allies to our philosophical acumen. In a living philosophical encounter the manager should feel real feelings and think real thoughts, living with those thoughts with more sensitivity, subtlety and force because of the accompanying emotions and because of the inspiration provided by the philosopher.[59]

As it becomes focused on applications, eager to communicate and hungry for life, the philosophy for managers challenges the Platonistic and abstractions-and-contents -excited tradition of the philosophical institution for the benefit of a *situational contextualism.* The focus will be on philosophy *that works* (in the spirit of PEIRCE, James, Dewey). The resulting philosophy for managers concerns itself with the situational, with the everydayish, with what is taking place in the managers' lives – with an engineer-like interest in improvement.

Do what works, fix what doesn't; figure out the most relevant whole that should work – these three basic aspirations of the creative managerial mindset provide operational guidelines for what I perceive as philosophy for managers. Philosophy's ancient promise of a good life must be combined with an improvement-oriented, responsible and process-aware approach that is hopeful, enthusiastic and eager to contribute.

Recall KANT's invitation to leave behind the "self-incurred immaturity" and his spirited call to step forward and engage in a *public use of one's reason.*[60] The philosopher's battle cry is for everyone to join the cumulative and mutually

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[57]Lyons-Ruth et al. (1998), Lyons-Ruth (1999, 2000), Stern et al. (1998), Boston Change Process Study Group (2002, 2005, 2007, forthcoming), Nahum (2000), Stern (2004).

[58]"By Systems Intelligence (SI) we mean intelligent behaviour in the context of complex systems involving interaction and feedback. A subject acting with systems intelligence engages successfully and productively with the holistic feedback mechanisms of her environment. She perceives herself as part of a whole, the influence of the whole upon herself as well as her own influence upon the whole. By observing her own interdependence in the feedback intensive environment, she is able to act intelligently." (Saarinen and Hämäläinen 2004, p. 10). See also Hämäläinen and Saarinen (2006, 2007a, 2007b, 2007c, forthcoming), Luoma et al. (forthcoming). The systems perspective relates philosophy for managers with the tradition of holism. For an excellent discussion of holism and systems thinking applied to the managerial situation, see Jackson (2003, 2006).

[59]For useful discussions of emotions, see Damasio (1999), Brief and Weiss (2002), Amabile et al. (2005), Barsade (2002), Barsade and Gibson (2007), Nussbaum (2001), Goleman (1995, 2006), and Knuuttila (2004).

[60]Kant's essays "An Answer to the Question: What is Enlightenment?" and "The Contest of Faculties" are among the all time greatest essays of generally understandable philosophy. Had academic philosophy taken them as paradigms, how much better the world would be. Foucault's essay "Kant on Enlightenment and Revolution" is also important here. It starts with the words, "Kant's essay 'What is Enlightenment?' seems to me to introduce a new type of question into the field of philosophical reflexion (sic)." Foucault then continues, stressing a point critically relevant for my own concerns in philosophy: "The question which seems to me to appear for the first time in this text by Kant is the question of the present, of the contemporary moment. What is happening today? What is happening now?" (Foucault 1986). Among contemporary philosophers, Foucault's call is particularly impressively picked up by Mark C. Taylor (2007) and Charles Taylor (2007).

inspiring dance of reason, dialogue, and the sharing of positive spirals upwards. Movements of thought, in plural but connected, uplifted by moments of meeting, charged with emotional energy (Randall Collins[61]), in the process of creating together better life and an bergsonian *élan vital* through a mutually co-regulated system of flourishing – such is the space of philosophy.

This means that when all is said and done, the anchor of philosophy is the *ideal of freedom*. Humanity involves the responsibility to think for oneself and to operate from within but with sensitivity for the whole. This call for freedom, inherent in the philosophical attitude, is ethical and political, personal and essential (as stressed out by Pico, Kant, John Stuart Mill, Sartre, Popper, Isaiah Berlin, and so many of the truly great).

Where the imperatives of renewal, growth and innovation are taken as fundamental, the space of possibilities that relate to freedom becomes a necessity.

Search for the Relevant

In the struggle between rigour and relevance, philosophy stands proudly side-by-side with the search for the meaningful, the significant and what truly counts. In other words, philosophy for managers proceeds to those dangerous battlefields where benefits are seldom immediate but where the questions of legacy, destiny and dignity will be decided. The task of the philosophy for managers is to highlight that choice forever, the choice that haunts us always, from within, from without, from the past and from the future: how are we to live *better lives right now*? Methods and theories come and go, but the relevance of relevance prevails. This emphasis on relevance is the cornerstone that the philosophy for managers must acknowledge from the start.

One of the most pressing challenges in a manager's practical affairs and leadership is due to the intense lack of clarity and multi-dimensional ambiguity of the current and foreseeable environments of life. We are surrounded by complexity, of which we ourselves are composed. The manager's actions and activities have far-reaching consequences she knows little of, effects pointing forwards in troubling, sometimes horrendous ways. The linear and non-linear effects and side-effects can destroy what we love most, but they can also reveal opportunities for dramatically productive interventions. Systems built by humans together with systems of nature amount to a web of complexity that calls for a constant need to re-evaluate and re-direct one's thinking in the service of more life-enhancing, self-adjusting, sensitive, and responsible mental models and modes of life (as argued so lucidly by Murray Gell-Mann, Peter Senge, and others[62]). As the Nobel laureate Murray Gell-Mann put it, "the task of integration is insufficiently respected".[63]

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[61]Collins (2004).

[62]Senge (1990), Senge et al. (1994), Senge et al. (2006). See also Scharmer (2007) for an impressive account of "Leading from the future as it emerges". Complexity research has given rise to important contributions on the leadership arena including Stacey (2003), Griffin (2002), Hazy et al. (2008), Fredrickson and Losada (2005). For a spirited philosophical discussion of complexity, see Taylor (2001).

[63]Arguing for the need to celebrate the "vital contribution of those who dare to take what I call 'a crude look at the whole'" (p. xiv), Gell-Mann writes: "People must therefore get

What is desperately needed are more sustainable, systemically well-founded and long-term responsible ways of thinking and acting.[64] What is demanded are mindful (in the sense of ELLEN LANGER[65]) and sensemaking (in the sense of KARL WEICK)[66] life skills in rapidly changing and complex environments that hide the current destructive practices. Here I think philosophy could and should help. Philosophy for managers, as a sort of systems and operations research and practice, should raise high the objective of mindfulness and sensemaking on its agenda. What was philosophy originally, anyway, if not sensemaking and about helping people become more mindful? The call is to life-directed metaskills, clusters of skills, of the ancient origin, of a *life that examines itself.* It is a desire to link the concrete, experienced, mundane, action-based everyday life and organisational life with dialogical, imaginative, responsible, qualitatively-tuned, philosophical thinking. It is called for because of the necessities and possibilities of the manager's life, because of survival and success in the unsettled, stormy actualities and contingencies in the life that she lives, *come what may.*

The meta-skills of life-management and self-leadership must rise from within the manager in accordance with the uncompromising human laws of mental growth. That progress can be strengthened, nurtured, enriched and invigorated through intellectual and philosophical methods. These methods are application-excited, multidisciplinary and multi-skilled in nature, finding their roots in us as unique human individuals with a superbly rich endowment of skills and potential capabilities. We are born as individuals but delivered into the hands of others, into the midst of others. Through inter-subjectivity we are to become mysteriously complicated systems, with something in the centre, a special Chosen One. Alongside the cognitive resources of that Chosen One there are implicit, process-intelligent, non-verbal, relationships-sensitive and emotion-based intuitions and sensitivities, which recent research in various sciences has subjected to fruitful examination[67] and which applied philosophy and philosophy for managers must utilise.

Therefore, philosophy for managers means supplementing the safe havens of pure intellectualism in favour of the unfamiliar power fields that are torn and moulded by innumerable forces high and low. This encourages – and forces – thinking to take action, all the way from results of science and scholarship to conceptual speculations and poetry, rationally and instinctively, on the wings

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away from the idea that serious work is restricted to beating to death a well-defined problem in a narrow discipline, while broadly integrative thinking is relegated to cocktail parties. In academic life, in bureaucracies, and elsewhere, the task of integration is insufficiently respected." (Gell-Mann 1995, p. 346).

[64]For a recent discussion of some of the issues involved, see Moser and Dilling (2007). This book is exemplary in its bringing together researchers and practitioners from various disciplines and backgrounds to articulate the barriers and mental models that hinder the communication of climate change and prevent facilitating the social change called out by it.

[65]Langer (1989), Langer and Moldoveanu (2000); notice also Langer's more recent *On Becoming an Artist* (2005).

[66]See Weick (1995) and other works; an authentic thinker and original mind, Weick is a leading figure in the field of organisational behaviour, and a key source for any serious philosophy for managers.

[67]Some key works here include Hobson (2002), Siegel (1999, 2007), Beebe and Lachmann (2002), Fogel et al. (2008), Baumeister et al. (2001), Lyubomirsky et al. (2005), Cozolino (2006), and Goleman (2006).

of imagination and with an awareness of an ethical upscale and a drive for the Good, while utilising sensitivities, interconnectivity in a never-ending *searching for possibilities.*

In the context of philosophy for managers, the human, life-philosophical, self-leadership-tuned and insight-for-each -seeking endeavours of an applied philosophy can naturally be examined utilising the *terminology and discourse of systems* – using concepts and words already familiar to managers as students of instrumental rationality but extending their perspectives from the artificial, constructed and from the objectively manageable towards life itself. It means calling attention to *living with systems* including even those systems which are beyond the rational eye, beyond all information given and represent a reality for which "all models are wrong" (in the words of the systems scientist John D. Sterman)[68]. And yet, the manager must act. We must all act, because reality does not wait, that system is in full swing – as a situation, as a work environment, as a supervisor-worker-relationship, as the fusion after a merger, as a product development process, as an undoing of a knot in a customer relationship, as an ongoing negotiation, as a challenge in parenting, as a tug-of-war in a marriage. Life does not wait, and the challenge is to live it better, improving the act on the spur of the moment. Life as a system involves connections to and from, it involves micro and macro phenomena, with flows and holistic effects with different intuitive and counterintuitive characteristics in surface structure and inner structure, all pulsating their own message. The challenge to the manager is to live intelligently, wisely, productively, with prudence and with courage, with fairness and with significance but above all as a part of systems that do not allow for a time-freeze and for a perspective from without. This calls for systems intelligence, for a life philosophy that constantly updates that intelligence, endowment within ourselves and in tune with what is emerging around us, in order to strengthen and nurture ourselves towards a better life and toward a more responsibly, fairly functioning society.

Alongside brilliant systems models the manager needs practical abilities to operate in life's various systems even in the absence of any models. This is the life-philosophical, situational, vitally important and humanly intensive subject matter of the philosophy for managers and the context where I have tried to work myself.

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[68]Sterman (2002). See also Sterman (1994) and his magnum opus Sterman (2000). Systems modeling is an important cognitive skill for managers, yet one should observe the outspoken observations of Ackoff (2006) on "why few managers adopt systems thinking". The systems intelligence approach that Raimo P. Hämäläinen and I have advocated seeks to overcome the cognitivist and objectival biases of mainstream of systems thinking. See the papers referred to in fn. 58 and especially Hämäläinen and Saarinen (forthcoming).

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David Bohm's "Thought as a System" and Systems Intelligence

Jarno Rajahalme

Willingness to observe our own reactions in everyday situations allows us to see that thought is driving us in a much more mechanical fashion than we would like to admit. Our tacit model of thought claims that thought just tells us how things are, and thus we fail to see how thought participates in our perception in fundamental ways. Without noticing it, we "see what we want to see" and "hear what we want to hear". Our thought has developed defensive reflexes against seeing its participation. However, we can learn to see ourselves anew and understand that thought drives all social systems in the same way it drives us. This observation may bring about a deeper understanding of our problems and opens a way for new creative solutions.

Introduction

THINKING ABOUT THOUGHT is notoriously difficult, and at first, it seems the benefits of doing so are few and far between. The book "Thought as a System" by the late David Bohm (1992) challenges the reader to dive into deep discussion[1] about the nature of thought from a systemic viewpoint.

While Bohm's text is very enlightening and inspiring, the discursive format of the book presents a challenge to the reader. The aim of this chapter is to illuminate the central themes of Bohm's book from the systems intelligence viewpoint (Hämäläinen and Saarinen 2007), hoping that this will facilitate in making Bohm's reframing of thought as a system more accessible.

The tenets of systems intelligence maintain that we, as human beings, are by nature systems intelligent – we are successfully participating in many systems simultaneously, even though we never fully know those systems and often are not even aware of them. We are called to do more of what we already do well, act in the present moment, making decisions affecting the course of our lives.

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[1]The book is a transcript of a weekend seminar with presentations of Bohm interspersed with questions and answers.

Bohm methodologically resists setting an objective for the discussion about thought, trusting in our inborn ability to change our reactions when we see something seemingly familiar (thought) from a new viewpoint.

Bohm uses the word "thought" in a wider sense than the typical dictionary would have it. The dictionary definition for "thought" includes both the process of thinking, and the mental products of such process.[2] Bohm's reframing of *thought as a system* also includes all external products of thought that we interact with, for example books and architecture.

The main theme of "Thought as a System" revolves around the mostly reflexive nature of our thought, rooted in the past, in contrast to live thinking in the present. These 'thought reflexes' are rather easy to see in normal emotionally charged situations, such as getting upset by someone stating something negative about you. The usual *reaction* is some sort of feeling of anger and at worst a violent outburst of primitive action, as if you had been physically endangered.

Thought reflexes are built by conditioning, and allow us to adapt to the environment we live in. Learning to drive a car takes some practice, but eventually driving becomes second nature, and we can find ourselves driving almost unconsciously, immersed in discussion, or in our thoughts. This kind of 'learning by conditioning' or "acquisition of automaticity" (Bargh 1999) is a key to our survival, allowing us to focus our attention on the novelty in the situation. Nevertheless, when the environment changes, we may be at a loss with our patterns of reaction as they might not fit the situation at hand.

By observing and then seeing the reflexive nature of thought in action we can open a possibility for a new understanding about thought and how it drives us. This observation also enables some real learning[3] to happen, where our mental models (Senge 2006) can be challenged so as to better match our current reality. Hopefully, this will also allow us to be more forgiving of others, who might not know what they are doing, when arrested by thought patterns of violence or hatred.

Tacit Assumption about Thought

Most people are "naïve realists" believing what they see *is actually the case*, "that some things are just plain True – and that they know what they are" (Sterman 2002). Our tacit assumption about thought, Bohm points out, claims that thought only tells us how things are. Thought is telling us: "This is the way things are, and you – the thinker – must decide what to do" (Bohm 1992, p. 211). If this assumption were true, there would be no reason to inquire about the nature of thought, since thought would just be doing what it was supposed to do. This is an example of what Bohm calls a "defensive reflex"; our tacit mental model lulling us into not seeing that thought deeply participates in our perception.

Another feature of thought is that thought is fragmenting the world around us (Bohm 1992, p. 3). This is by necessity, since we need the phenomena to be

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[2]Merriam-Webster Online, http://www.merriam-webster.com/dictionary/thought
[3]Ref. *Metanoia* (Senge 2006, p. 13), compare to Bohm's "flash of insight" (Bohm 1992, p. 30, 182, and 221).

separated and classified in order to function properly as agents in our environment. What is wrong about this is that thought gives that these boundaries are *real*, part of reality itself. In fact, the boundaries are drawn by thought, like the boundaries between nations on the map of Africa. These boundaries may be functionally right to a point, but when the world changes these artificial boundaries may become sources of great problems.

Our tacit model of thought also claims that thought is somehow radically different from our (other) bodily functions, Bohm maintains. The main reason for this is that we *think so*, and therefore perceive it to be so. Obviously it would help if we knew exactly how thought arises from our physical bodies, but the best we can get is the understanding that our thinking and other bodily functions are in some kind of a causal loop relationship. The state of our body influences our thinking (e.g. bodily stimulus rising above the level of conscious awareness, anesthesia, effects of psychedelic drugs, etc.) and our thinking influences our bodily functions (e.g. willed action, psychosomatic disorders).

Our conceptions, language and institutions mould the reality so that our beliefs become self-fulfilling (Ferraro 2005). It seems evident that this phenomenon hits us also in our understanding of ourselves through our ideas of thought.

Towards Better Mental Models of Thought

To cope with the problems we face as individuals and as a society, we need a more truthful understanding of the nature of our thought – a better mental model than the one we have built implicitly so far. It should be noted that "all models are wrong" (Sterman 2002), and the task at hand is not to find the Truth about thought. All models are simplifications, abstractions, hopefully capturing some essential aspects of reality. All we can hope to find is *a better mental model* of how thought drives us. This model will not come from a textbook (or a chapter like this!), but from experience, just like the original one. Continual openness to the possibility that there *is* something to fix in our worldview is a prerequisite for any real learning to take place.

There is hard scientific evidence that thought participates in our perception (e.g. Balcetis 2006[4]), but the main vehicle Bohm offers towards the more truthful mental model of thought is to see how thought participates in our own perception, and thus does *not* just tell us how things are. For example, prejudice makes us categorize people into existing classes based on some superficial traits, as if we knew the person in question.[5]

Bohm's reframing of *thought* includes not only the conscious mental processes at present (what he calls *thinking*), but also the mental traces of past thoughts (*thought*) that operate in us mostly unconsciously, as automated reflexes. In similar fashion he separates *feelings* from *felts*: *Feelings* are connected to present sensual

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[4]This study suggests that motivation has an effect on preconscious processing of visual stimuli and thus guides what is presented to conscious awareness.

[5]It is difficult to not be affected by prejudice we know of, and impossible when most of our prejudice is unconscious to us. (Bargh 1999) suggests that value judgments become part of the structure of our mental models, and are therefore practically impossible to shake without rethinking the whole situation.

reality (e.g. physical pain), or are brought about by our thoughts interpreting our situation in a certain way (e.g. fear of danger). *Felts* are memories of past feelings resurfacing through thought. According to Bohm, most of our "feelings" are actually produced by thought. The overall *system of thought* includes these as well as all other products of thought (books, speech, architecture, etc.).

Bohm emphasizes the operation of the categories of *necessity* and *contingency* in our thought. When something is necessary, it cannot be otherwise. When something is contingent there is room for choice, we have options. *Absolute necessity* becomes an imperative we cannot get around. Our actions are fundamentally affected by what we hold as (absolute) necessity. We will simply *do* what we think as necessary, and we can ponder or delay action when there is any contingency. If we hold that thought only tells us how things are, we will not hesitate to act accordingly. But if there is any contingency, i.e. if we understand that something might distort our perception of a situation, we have an option to suspend our reactions. This also works the other way around: When we observe ourselves reacting as if there was no other choice, we have surfaced a category of necessity in our thought.

> *"Thought doesn't know it is doing something and then it struggles against what it is doing."*

Finally, thought seems to be unaware of its own effects. As a result, it fights against these effects, again without observing this. Or as Bohm puts it succinctly: "*thought doesn't know it is doing something and then it struggles against what it is doing*" (Bohm 1992, p. 10, italics by Bohm). It seems we have a shortsighted view on the system closest to ourselves. We fail to see the causal link between our thought and e.g. affect, maybe because of a delay of a couple of seconds between the two (Bohm 1992, p. 40), or the automatic attribution of the cause to something else present in consciousness (Wegner 1999). Instead of an endless fix of "symptomatic solutions" (Senge 2006), the systems intelligence viewpoint on thought as a whole might enable us to first look, and then to find the locus of real leverage where an intervention is in order.

Incoherence

When we get outcomes we do not want, there is some *incoherence* in our thought. Our usual reaction to incoherence is to fight the outcomes, when it would be more advantageous to try to find where the incoherence is. There are many potential criteria for coherence. One possibility is to hold pleasure and pain as the criterion for coherence and incoherence, correspondingly (see e.g. Ryan 2001). However, not all pain is due to incoherence or pleasure due to coherence. The criterion Bohm suggests is:

> The criterion for coherent thought is that it is true and correct. But if you can get pleasure or pain from thought then coherent thought is no longer functioning. Rather, the criterion has become whether the thought gives pleasure or pain, consequently that thought becomes destructive. (Bohm 1992, p. 49)

Another danger with mixing pleasure with coherence is the fact that our thoughts are capable of producing endorphins in our brains that make certain thoughts feel very good. A prime example is the feeling of being "right", while someone else is "wrong". The pleasurable effects may make us addicted to these thoughts. All evidence of addiction should raise concern about incoherence that ought to be rooted out.

When thought does not want to see its participation and struggles against its own results, but still insisting to keep on with that way of thinking, we have what Bohm calls *sustained incoherence.* It seems we can afford to be coherent with things not so important to us, but when there is evidence of incoherence in things related to our worldview, for example, we find all kind of reasons against considering any of it any deeper. In words attributed to Leo Tolstoy:[6]

> I know that most men, including those at ease with problems of the highest complexity, can seldom accept even the simplest and most obvious truth if it be such as would oblige them to admit the falsity of conclusions which they have delighted in explaining to colleagues, which they have proudly taught to others, and which they have woven, thread by thread, into the fabric of their lives.

Reflexiveness of Thought

One of the most fundamental points in Bohm's reframing of thought is that thought is reflexive, and more like our other bodily functions than we tacitly realize. Just like your knee will jerk if hit on the nerve, your thought will fire existing patterns given suitable stimulus. The example Bohm uses is the fact that you will get upset e.g. if your value as a person is belittled, even if the insults were coming from someone you do not know, and especially so if you are insulted by someone you hold dear. Moreover, if you suddenly realize that you misheard the words, and in fact, you were not insulted, you can calm down very fast. These reactions are driven automatically by thought, your interpretations of the impulses in relation to your self-image.

Thought reflexes build up to big systems of reflexes, chains of thought, including e.g. logical thinking (Bohm 1992, p. 53), mathematics, or any other symbol system you may be immersed in. The whole of thought is a virtually unlimited system of mechanical reflexes. One specific class of reflexes are the defensive reflexes (such as stereotypes, Spencer 1998) whose function is to keep the thought system intact, basically resisting all structural change. There is evidence that some of our conscious "thinking" is actually rationalization of what is going on in our reflexive system of thought (Libet 1985, Bargh 1999, Wegner 1999, Libet 2004).

We could not survive, had we to consciously decide all the action ongoing in our bodies. Therefore, the reflexes are there to help us. All the reflexes have some historical reason for their existence. The problem with this is that when our environment changes, the reflexes should be adaptive enough to save us from the confusion and problems caused by incoherent behavior. So far it seems that the

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[6]Attributed to Leo Tolstoy in e.g. Hoover (1999, p. 233), but with no source mentioned.

humanity has adapted amazingly well, but it seems possible that in the global community we face such big problems that the prevalent thought reflexes driving e.g. war on terrorism will not help us very much.

Bohm postulates that seeing things for what they are with suspension of thought reflexes could open up a window for some real, live *thinking* to happen in the present moment. This could lead to a flash of intuition that then changes our thought reflexes. You could imagine the reality of lung cancer to sink in causing a person to quit smoking instantly, even if she had tried that many times before without success.

Seeing Reflexes in Action

It is important not to accept Bohm's view on the thought as a system without personal experience. There is a real danger of illusionary thinking that one has "understood" based on just reading about this, but that could just be yet another defensive reflex keeping your existing comfort zone intact.

A good example Bohm gives is:

> If you think that a certain person has treated you badly you may get angry. Suppose that somebody keeps you waiting for a couple of hours. You can get angry thinking: 'What does he mean treating me like this? He has no concern, no consideration for me.' You can think of various things: 'He's always doing this, he treats me badly', and so on. By thinking that way you can get very angry. Then if he comes and explains that the train was late, the anger goes. This shows that the emotion was influenced by thought. By changing your thought, the anger fades. (Bohm 1992, pp. 6–7.)

Bohm suggests we try to find the words that best describe the implicit thoughts that operate in the background, thus lifting them up for conscious scrutiny. When the words get accurate enough, there could be a feeling reaction (or more accurately, a *felt*-reaction), which shows you the thought reflexes in action, like in the example above. If you can suspend further reactions you should be able to see how the feeling reaction will fade away. Finally, Bohm claims that it is important for you to verbalize what you have seen, in effect lifting the once implicit thoughts to consciousness. From there you may be able to re-evaluate the potential insignificance of this specific thought, allowing the reflex to loosen its grip on you.

Openness of Thought

Having the insight that thought is reflexive is potentially quite shaking. By now, it should be easy to accept that thought is always just a representation – never the thing itself. Thought is never complete, there always remains room for better, more accurate representation. This is evident in the evolution of the sciences; in material physics, we have had a succession of increasingly more accurate models.

Moreover, nothing guarantees that there will ever be a final explanation to the structure of matter for example.[7]

We become possessed by the "truth" we think we possess. Since there is no security in the final knowledge of anything, it is better to stay open to the unknown. This openness is the precondition for the reflexes to yield when they no longer fit the ever faster changing reality around us. The new balance will come when you are ready to receive it.

We become possessed by the "truth" we think we possess.

Proprioception of Thought

Proprioception is the process of being aware of our internal bodily stimuli. For example, proprioception allows us to immediately know whether a movement of our limbs has been caused by ourselves or not. In some cases there is incongruence between the motor intention, awareness of movement and visual feedback, which can result in pathological pain (Harris 1999). McCabe et al. (2003) have shown that mirror visual feedback can be utilized to treat this condition in non-chronic cases.

Bohm maintains that thought is rather similar to our other bodily functions,[8] which raises a number of questions about the possibility of proprioception of thought. Firstly, if we lack proprioception of thought, what would be the consequences? Secondly, is it possible to develop proprioception of thought, i.e. learn to sense the movement of thought? And finally, would it be possible to sense the participation of thought in your perception?

If we did not have proprioception of thought, most of the thought would operate unconsciously to us. Thought would have free reign over us, following the cultural and personal ruts that have been built through repetition since our birth. We would find ourselves in situations we do not like without understanding how we got there, or what to do about it. We might find ourselves unable to do the things we know to be right, relapsing to the same old habits as always before.

Bohm suggests that there is proprioception of thought when you realize your reaction being just a mechanical reflex, allowing you to see the emptiness of prejudice, for example. Our thought implicitly holds that proprioception is not necessary; if thought were only telling you how things are, there would be nothing to be aware of, since there would be no place for incoherence. However, seeing the reflexive nature of thought makes the proprioception of thought seem very important.

The Collective Nature of Thought

When it comes to thought, no man is an island. The system of thought is more social and cultural than it is individual (Bohm 1992, p. 187). Or like Nisbett

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[7]For more on this theme, see e.g. *The Qualitative Infinity of Nature* (Bohm 1957).

[8]This view has recently gained acceptance under the title "Grounded Cognition", see (Barsalou 2008) for an overview.

et al. (2001) put it, "systems of thought exist in homeostasis with the social practices that surround them." Or even more fundamentally, the human capacity for thought seems to develop from the intersubjective relatedness between the baby and the caregiver (Hobson 2002). All through our lives, we are receiving thoughts, internalizing them (through repetition and emotional affect) and then sending them out again. Every now and then we will develop a thought of our own. Are all these thoughts important and valuable in themselves? Alternatively, do the thoughts themselves only have a relative value, should they be evaluated as a whole via the outcomes they lead to? Senge puts it (2006, p. 225) like this:

> Once people see the participatory nature of their thought, they begin to separate themselves from their thought. They begin to take a more creative, less reactive, stance toward their thought.

All communication we have can be seen as exchange of thoughts, and ultimately, meaning. Bohm presents dialogue as open exchange of thoughts where we do not avoid conflict, but suspend our immediate reactions (the mechanical reflexes), just as we did earlier with our own thoughts and reactions. We will see that we are all on the same situation with our thought reflexes, and our own relative cultural backgrounds. We all have our prejudice that will distort our view of the reality. When we take the effort to understand the point of views of each other without imposing our own agenda, we might find ourselves from a place of stillness that enables new, creative solutions to emerge.

Conclusion

Largely, we are what we think we are.[9] It seems we innately seek a balance between our thinking and our being. Thus, the way we think has tremendous leverage on how we function. Thinking in general is fed from unconscious sources (Jung 1921). This suggests that "we should nurture the conditions in which free play of unconscious mental activity may proceed" (Libet 2004).

Bohm maintains that thought is not a closed system, but open to intuition that has the potential to change the structure of thought. Intuition does not come at will, but there are ways in which we can give more space for intuition to operate. We can learn to still our minds to free ourselves of the excess thought clutter by being more present in the now. We can get more to our senses and be less in our heads. It may well be that for many of us the balance between the feeling and thinking functions (Jung 1921) has been lost on the side of incessant thinking. What if you do not need to be thinking all the time?[10]

Seeing the incoherence we face as an opportunity for intervention in the thought system is our natural systems intelligence at work.

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[9]A kind of self-fulfilling theory (Ferraro 2005).

[10]Rest assured, the impulse to think will be back very shortly after you manage to squelch it. What do you think happens every morning when you wake up?

Throughout the book, Bohm stresses that there is no objective; we are not aiming at any specific goal, other than learning about thought. Any goal pursuit would taint the effort, likely making us think "I got it" prematurely and thus missing the point. By exposing how thought drives us, gives rise to our feelings and sets our moods, Bohm equips us with a powerful tool. Gaining a more open view to *thought as a system* fosters systems intelligence in us. By seeing the systemic structures of thought we can become not only better thinkers (which sometimes means thinking *less*), but can also gain a new kind of leverage on situations we face in our lives. Seeing the incoherence we face as an opportunity for intervention in the thought system is our natural systems intelligence at work.

In closing, keep in mind that "Your incoherent actions are reflexes. You are not doing them on purpose. You don't know that you are doing them." (Bohm 1992, p. 64). Moreover, by extension, this wisdom should apply to others as well; as it was put some two millennia ago: "Father, forgive them; for they know not what they do."[11]

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[11]Luke 23:34 (KJV)

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Emotions, Decision Making and Systems Intelligence

Mikko Dufva

Emotions affect our decision making. They also hold potential that is often unused but could be beneficial to decision making. This potential can be harnessed by viewing emotions and the decision situation as systems. This brings into focus the interplay between feelings and reason. The regulation of emotions is a dialogue between feelings and reason, a dialogue that can be initiated by positivity.

Introduction

E VERYBODY MAKES decisions. Some can be routine or automatic, such as what to wear and whether to take the bus or car. Deciding on a company's strategy or where to live are bigger issues needing more consideration. The usual course of action is to gather large amounts of data, think of alternatives other than the usual yes/no and then use some sort of heuristic to make a choice. Nobody wants to make a bad decision, so the choice needs to be as good as possible. Often the goodness is decided only when the consequences appear.

The ideal of rational decision making is pervasive in our society. Managers often make decisions based on facts and the "soft" side of things is overlooked. This idea of rationality has been challenged lately by the advancements in neuroscience, which is blurring the line between rational and emotional. According to Damasio (1994), rationality and emotions are intrinsically linked together. Decision making involves subtle processes that depend upon emotion (Naqvi et al. 2006). Wenstøp (2005) builds on this and argues that multi-criteria decision analysis should put more emphasis on emotions to increase rationality in decision making. Furthermore, the theory of Multiple Intelligences (Gardner 1993) has broadened our view of human competencies and intelligence. Emotional Intelligence in particular (for a recent summary see Mayer et al. 2008) stresses the significance of emotions and emotional knowledge in human action.

This chapter will focus on an individual making an important decision. The range of decisions start from deciding whether to buy a new toaster to deciding

which job offer to accept. The essential aspect is that the decision requires some thinking. The focus will be on an individual, although I acknowledge that emotions are dependent on the environment and other people[1]. Rather than providing an extensive presentation of emotions and decision making, I will point out some important aspects of the topic from the point of view of systems intelligence (Hämäläinen and Saarinen 2004).

Emotions Hold Potential

Emotions can be viewed as beneficial or harmful to decision making. Seo and Barrett (2007) describe these two views as "feelings-as-bias-inducer" and "feeling-as-decision-facilitator". The former view holds a phrase "keep a cool head" as its guiding principle, the latter is more about "listening to your heart". These two views assume that emotions and reason are independent of each other, an assumption that is challenged by recent work in psychology, behavioural economics and neuroscience (Sanfey and Cohen 2004).

The "keep a cool head" view focuses on the uncontrollability and unpredictability of emotions. Drawing on a body of research, Seo and Barrett (2007) list several biases that emotions can cause. For example, unpleasant feelings can cause a person to focus on the short-term benefits regardless of the long-term consequences. Emotions also affect what information comes to our mind when making decisions. All this uncertainty leads to emotions being suppressed or ignored when making decisions. The "feelings-as-bias-inducer" view focuses on what people do about their emotions and how emotions shape their behaviour (Seo and Barrett 2007).

Weber and Lindemann (2007) describe "calculation-based decisions", in which a person analyses the potential rewards against the potential costs to herself. This method has produced several helpful tools to aid in the calculations, for example cost-benefit analysis. Damasio (1994) has critiqued this kind of decision making and depicts that the goal in this "high reasoning" is to act according to the theories of Plato, Descartes and Kant and to avoid emotions, a goal that cannot be achieved.

The "listen to your heart view" focuses on the possibilities of emotion. Weber and Lindemann (2007) call this type of decision making, which is governed by our feelings, "affect-based decisions"[2]. George (2000) describes that emotions can be a great source of strength and creativity. They bring new information to mind, help quick organizing and prioritizing and enable engagement. This is especially helpful in situations involving time restrictions and uncertainty. The "feeling-as-decision-facilitator" view focuses on how people experience their feelings (Seo and Barrett 2007). It focuses on the possibilities that emerge from emotions.

Systems intelligence believes that emotions should be taken seriously into account in decision making. Emotions are a part of our competence. Because of their unclear nature compared to fact-based knowledge, we may disregard them

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[1] For example mood contagion (Barsade 2002) is an important aspect in group processes.
[2] Weber and Lindemann (2007) also describe a third kind of decision making, "recognition-and-rule-based decision", which are governed by implicit or explicit rules.

as interference to our otherwise well-oiled decision making mechanism. However, emotions are useful interference and despite their fuzziness can guide our action fruitfully.

Emotions may seem to disrupt the rational thinking process. But emotions can actually bring a more holistic and farther reaching view of the situation. Maija Vanhatalo (2007, p. 149) discusses this by describing behaviour in the ultimatum game reported in the literature she studied. Based on work by Mellers (2001) she writes that emotions bring a long term gain to mind and that "our emotions and social intelligence are actually more efficient than we would think".

According to an experiment known as the "Iowa gambling task" carried out by Antonio Damasio and his colleagues (Damasio et al. 1997) people can feel an advantageous strategy before being aware of it.[3] Without any prior knowledge the participants of a gambling experiment soon started to play profitably. However, when asked; they could not say what was going on or what kind of patterns there were in the game until significantly later in the game. Their body was telling them to avoid certain decks of cards by stress mechanisms such as sweaty palms. Drawing from this experiment it is possible that people can "feel" the system before understanding it or before being able to rationally describe it. And not just feel the right alternative, but also to act according to the feeling – without realizing it. This sort of "human intelligent action" is what systems intelligence wants to highlight:

> To know about a system is critical in many cases. But in actual conduct of life it is often even more fundamental to sense *the feeling of a system*. (Hämäläinen and Saarinen, forthcoming)

Malcom Gladwell's book Blink (2005) describes several other examples, where an expert makes an accurate judgement in the blink of an eye by simply listening to her feelings. For example, an expert can tell if a statue is original or fake at a glance, basing her judgement on "because it feels that way". This is often described as intuition.[4] An expert has come to trust her feelings in a familiar system. She is open to her feelings, knows what they signal and is able to act accordingly – she is acting systems intelligently.[5]

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[3]Maia and McClelland (2004) have repeated the experiment using a more sensitive questionnaire and argue that people in fact have conscious knowledge of the advantageous strategy. This shows that it is possible to have conscious knowledge, but not be able to put it in words, when the question is broad, as was in the original Iowa gambling task.

[4]According to Dane and Pratt (2007, p. 36) intuition is "a (1) nonconscious process (2) involving holistic associations (3) that are produced rapidly (4) which result in affectively charged judgments." Intuition can help us form a quick understanding of the problem, the accuracy of which depends on our understanding of the problem domain. Our emotions play a notable role in intuition, affecting both the process and the end result (Dane and Pratt 2007).

[5]Another view to our hidden potential is that of bounded rationality (Simon 1957). Bounded rationality is not about optimizing our benefit and not about irrational decision making, but rather about taking into account the specific characters of the occurring situation and using heuristics fitted to the context (Selten 2001). Emotions inform us about the specifics of the situation and can shape our heuristics accordingly (Fessler 2001). They are thus a key part both in acquiring information about our surroundings or situation and also in choosing a favorable action.
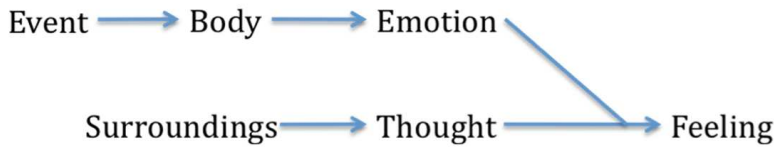
Figure 3.1: Emotions and feelings.

Systems intelligence wants to highlight the whole human potential, not just the rational dimension in us. In doing so, the perspective combines Senge's ideas of systems thinking with what he calls personal mastery (Senge 1990). While the former seems largely a cognitive construct, the latter takes into account human feelings and sensibilities as receptors of signals from the surrounding system.

The key to accessing our hidden potential is to be open to emotions and different possibilities. Scharmer (2007, p. 9) lists seven leadership capacities, including "holding the space", which means listening to oneself and "what life calls one to do", and "observing", which means "suspending the voice of judgement" and observing "with an open mind". Some restrictions are only caused by our mental models to which we cling onto tightly. Being open to the possibilities invariably around us is the first step towards embracing a more whole approach to decision making and to life itself.

Emotions Form a System

In everyday conversation the words emotion, feeling and mood are used rather ambiguously. Emotion is described as the body's response to some event or personal meaning and feeling is the experience of emotion attached to some cognitive situation (Damasio 1994). We see or think of something, which leads us to have an emotion and combined with our thought at that moment leads to a feeling. For example If we are on a way to meet a dear friend and see a smile in someone's face leading us to have the emotion of joy we may feel happy, because we were thinking about the exciting meeting about to happen. A simple diagram is presented in Figure 3.1. Emotions and feelings are not independent objects, but are connected to us, our surroundings, our thoughts and other emotions and feelings.

Although emotions are interconnected, different emotions have been recognized. The discrete emotion approach talks about basic emotions such as joy, love, anger, fear, sadness, disgust and surprise (Barsade and Gibson 2007, p. 37). According to Fredrickson (2001, p. 219) these are often linked to specific action tendencies. We feel an emotion and it makes us act in a certain way. For example, we feel fear when meeting a growling, big bear and have the urge to flee and we feel disgust when discovering rotten berries and we avoid them. This sort of automaticity has been evolutionarily important to us and has probably saved our species from extinction. However, viewing emotion as automatically leading to action is too simplistic a view of the emotion as a system.
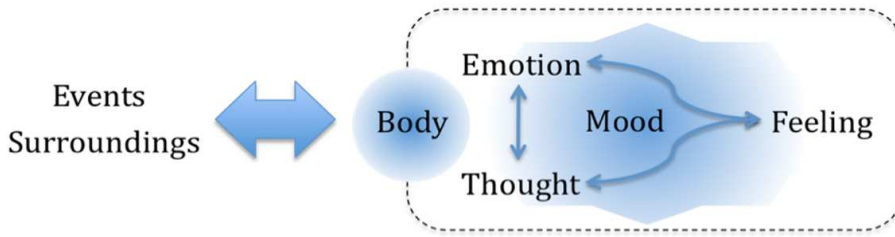
Figure 3.2: Emotion as a system.

Damasio (1994) distinguishes primary emotion from secondary emotion. Primary emotion is the above-mentioned automatic response to different features such as the size of an object, sound and motion – the basic emotions linked to specific action tendencies. Secondary emotion builds on the primary emotions. It is a learned response to a certain situation and requires that we are able to separate the current situation from the experienced emotion. Primary and secondary emotions are thus interdependent.

The discrete emotion approach talks about basic emotions such as joy, love, anger, fear, sadness, disgust and surprise.

One important thing missing from our emotion as a system is mood. Mood is less intense and clear than emotion and usually lasts longer (Barsade and Gibson 2007). Moods are the general tone of feeling good or bad. Damasio (1994) uses the term "background feeling" to describe feelings that are not dependent on emotions, but rather are the sense of existing. Moods can be understood as the general feel of the system. Figure 3.2 depicts one interpretation of the overall emotion as a system.

Understanding the emotional system can be described as "emotional knowledge" (George 2000) or "emotional understanding" (Salovey et al. 2002). Achieving this emotional understanding may seem to be difficult. It is hard if not impossible to draw an accurate picture of our emotion as a system or describe it in words. As Stern (2004 p. 112) writes: "Because the present moment is mentally grasped as it is still unfolding, knowing about it cannot be verbal, symbolic and explicit". The key is that objectively describing the system is not necessary for successful action, but being aware of it is crucial: "awareness of emotions is necessary for their management." (George 2000, p. 1038).

Scharmer (2007, p. 9) speaks about sensing and connecting with ones heart, meaning "open" knowing which "is gained by means of interconnected wholes". Things are interconnected and we cannot step away from our emotions and feelings. We are part of our emotion as a system, part of which is hidden. Systems intelligence acknowledges that emotions create a system that connects with the system of the situation. As Siitonen and Hämäläinen (2004) write:

> Systems intelligence appears in (1) understanding that both the visible
> and invisible structures guide the participants' behaviour, and (2)

> in using this observation to create processes, which produce systems intelligent thinking and behaviour.

Just being aware of feeling "bad" or "good" does not help very much. It is necessary to identify emotions, to know the difference between e.g. being excited and happy. Seo and Barrett (2007) use the term "emotion differentiation" to stress the ability to distinguish and describe specific feelings. This does not mean being able to express feelings objectively. Rather this "emotional perception and expression" (Salovey et al. 2000) is about being able to recognize information from the emotion as a system.

Systems intelligence believes that these kind of abilities are present in each one of us and they arise from "an intuitive, instinctual and sense-like grasp of what we believe is the system" (Hämäläinen and Saarinen 2007, p. 9). We may have lost the connection to our feelings and may feel that we are not able to differentiate between feelings, because we have never had to use that skill. Systems intelligence believes that the link to our feelings is there, even if we have ignored it for a long time. Once we begin to approach the decision more wholly we may begin to act from the emerging whole. Scharmer (2007 p. 9) calls this capacity "presencing". As Hämäläinen and Saarinen (forthcoming, p. 3) write:

> In the systems dimension, humans have remarkable abilities to learn and improve even in the absence of explicit objective knowledge. As systems creatures with great survival and success skills, people are more improvers than truth seekers.

Emotion as a System Connects to the Decision Making System

Emotion as a system is part of a larger decision making system, which also includes the decision maker. Decision making becomes dynamic because it shapes the state of the system. The decisions we make today have an effect on the possibilities we have tomorrow. It is important to know the system and be aware that it is constantly changing.

Sterman and Sweeney (2007) argue that people, including those who have extensive training in mathematics and science, have a poor understanding of dynamic feedbacks, delays and other systemic phenomena. Yet, from the systems intelligence view, we have been and continue to be able to act successfully in complex dynamic systems. Drawing, modeling or depicting the system may be useful in some situations, but in everyday life it may be too troublesome. Describing the system requires us to take one to step out of the system.[6]

We do not always need to describe the system to be able to act from within it. This "withness-thinking" (Shotter 2006) enables one to tune into the system and have a sense of the direction in which the system is going. Systems intelligence believes that humans have the ability to get a hold of environments with uncertainty and dynamic feedbacks. As Leppänen et al. (2007, p. 5) write:

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[6]Shotter (2006) calls this "aboutness-thinking".

> Systems intelligence argues that a human agent experiences her inter-dependence of the environment in a way that is intelligent by definition, and with this intelligence, the agent is able to act productively.

Mayer et al. (2008, p. 527) define emotional intelligence as "the ability to carry out accurate reasoning focused on emotions and the ability to use emotion and emotional knowledge to enhance thought." This can also be called emotional sensitivity. Systems intelligence wants to go beyond emotional sensitivity to systems sensitivity. Rational thinking is connected to emotions and to drive the system intelligently a certain sensitivity for it is needed.

The emotion as a system is complex in itself and the whole decision situation can seem overwhelming. If everything is interconnected and emotions also have negative effects on decisions, some kind of systems intelligent management of emotions is called for. A Systems Intelligent person views herself as part of a decision system she cannot fully describe, but from which she must act. As Hämäläinen and Saarinen (2007, p. 50) write:

> Systems intelligent leader ... operates within the visible system and manages the emotional system simultaneously.

Regulation is Dialogue

It is time for action. To be able to drive the emotional system, regulation is needed.[7] This regulation of emotions is the core of systems intelligent action in decision making. It is not the same thing as suppressing or ignoring them. Shutting our emotions off is not possible and ignoring them narrows our understanding of our mental models. We are able to see our mental models more clearly from looking at our emotions than from looking at our logic. Rantanen (2007) analysed the Enron case and argues the importance of reflection and the dangers of ignoring and suppressing emotions. He suggests that Ken Lay, CEO of Enron, ignored the feeling of sadness, of letting go, in his divorce thereby creating a pattern that recurred also in his professional life (Rantanen 2007, p. 174).

Instead of choosing between emotional and rational, we can look beyond such dualism. Feelings and reason should be thought of as being part of a dialogue. Once we are aware that emotions hold potential and form a system connecting to the situation as a system, it is natural to embrace the interconnection between the emotional system and our rational thinking.

Fogel (2007) uses a term "co-regulation" to describe the communication system between e.g. a mother and an infant. I will borrow the term to shed light on the dialogue between emotional and rational. Fogel (2007, pp. 251–252) describes coregulation as

> a form of coordinated action between participants that involves a continuous mutual adjustment of actions and intentions. During co-

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[7]Seo and Barrett (2007) describe this regulation of current feelings as "affective influence regulation".

regulation, the communication system acts as a single entity such that
action cannot be parsed into "individual" and discrete contributions.

It is possible to view the interplay between our reason and feelings during a
decision situation as continuous and something that cannot be stripped down
to its parts or discrete contributions. Instead of thinking that reason produced
this part of the consideration and feeling this part, the whole process leading to
a decision emanates from one communication system. It is as though we could
simultaneously move the two banks of the decision stream, emotional and rational,
to guide the process.

Leppänen et al. (2007) use the terms "objective control paradigm" and "sub-
jective action paradigm" to describe the two intellectual paradigms systems
intelligence wants to connect. Both rational reasoning and embracing of emotions
are needed and they even complement each other producing together something
more than the sum of its parts.[8] This interplay of emotions and reasoning, as well
as the situation and ourselves can be imagined as a system. Contrary to more
traditional methods of systems thinking, the focus is on action, not in describing.
Because we are a part of the system, we cannot unfold it, but we can act in it
and even change it.

Positivity Opens the Dialogue

The dialogue between emotions and rational thinking can best be initiated by
positive emotions. "Co-regulation" requires trust, which is usually more available in
a positive atmosphere. Without trust the dialogue will easily become a monologue,
regulation from above, a dictatorship of either reason or emotion.

The broaden-and-build theory of positive emotions states that positive emotions
can "broaden people's momentary thought-action repertoires and build their
enduring personal resources" (Fredrickson 2001, p. 219). Negative emotions narrow
our thinking and acting by creating the urge to act immediately, e.g. flee in fear
or attack in anger.[9] This has been useful in the past, when survival was an
essential concern. On the other hand, positive emotions broaden our thinking
and acting, e.g. joy encourages us to play and be creative, interest makes us
explore and contentment tells us to savor and maintain the present (Fredrickson
2001). Positivity can shape the emotion as a system to produce not just better
decisions but also a better life. Decision making is not just about choosing the
right alternative. It is about learning about the system and changing it and
ourselves with it.

If negativity has kept us alive in the short term, in situations with immediate
danger, positivity has made us flourish. It is something each of us possesses.
As George (2000, p. 1038) concludes: "Research has found that people strive to
maintain positive moods and alleviate negative moods". Our natural tendency

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[8]Seo and Barrett (2007) suggest that it is possible to take the benefits of "affective reactivity"
and use "affective influence regulation" to get rid of the negative effects, if "emotion differentation"
is used.

[9]Baumeister et al. (2007) critique this kind of direct causation theory of emotions. They see
emotions rather as guiding and providing feedback.

is to be in a positive mood, making us more open to exploration, creativity and holding on to good. Systems intelligent decision making focuses on the good use of positive emotions.

Losada (2004) has studied the effect of the ratios of positivity vs. negativity, inquiry vs. advocacy and others vs. self on the performance of management teams. In high performing teams there is more positivity than negativity and the same amount of inquiry and advocacy as well as a balance between self and others. One way to interpret this is that high performing teams are more positive towards the ideas presented and are able to accept new possibilities, also those that never had occurred to them before. They are ready to challenge their system and bring something new into it. Positivity opens the dialogue between the team members and also between feelings and reasoning.

Conclusion

Our emotions offer us insight into a decision. Naturally, we also benefit from knowing the facts. The facts and emotions can seem to be in conflict pulling the decision in separate directions. The temptation to only listen to reason or feeling is strong, causing us to suppress our emotions or to act impulsively.

When thinking of the decision making situation as a system also including the decision maker, the conflict changes into interaction. Different perspectives are opened to the problem at the same time. We feel and think simultaneously. It is like touching and looking at an object – we get a more complete picture of it if we both touch and look at the object than if we suppress looking by closing our eyes and depend only on our touch.

The co-management of both emotion and reason is needed. Because, in working life, we are used to making our reasoning transparent, the management of emotions is usually in focus. But systems intelligence in decision making is actually about regulating both by creating a dialogue between them. It is about coregulation, not dictatorship. If an object looks heavy but feels light, as some plastic stones do for example, we have to combine the conflicting information. This leads us to something new, if we are open to it.

Positive emotions make us more open to possibilities. In decision making this can undo a gridlock situation by presenting a new direction. Even more than helping decision making, positivity also makes our life better.

Emotions, feelings, body, thought, surroundings – are all linked to each other. The borderlines can be blurry and all the interconnectedness can make us feel lost. Fortunately, nobody is asking us to draw a picture of the system of our decision. What is required is action. And systems intelligence believes that people have been and are able to act successfully in complex situations.

Neuroscientists have discovered how our rational thought and emotions are intertwined in our brains (Damasio 1994). We could start thinking that emotions in all their strength are not against us if we are not against them.

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CHAPTER 4

Systems Intelligence: The Way to Accommodate Affect Control of Oneself and Others

Teemu Meronen

This chapter reviews control theories in sociology from the systems intelligence viewpoint. I present affect control theory as a potential way of understanding human behavior and suggest systems intelligent action in this framework. One aim of this chapter is to explain how a systems intelligent person can improve her behavior by tuning herself to learning. Control theories in sociology provide important knowledge about human behavior, so this chapter presents suggestions on how a systems intelligent person reflects her own actions by observing the principles of affect control theory and improves her positive contribution in social situations and relationships.

Introduction

CONTROL THEORIES IN SOCIOLOGY are used to explain human behavior. We assume that these theories are a valid way of describing how we act in political systems, social relationships and in identity processes. In this chapter I explain what control theories in sociology mean, present affect control theory as an example of control theory in sociology and discuss the origins of control theories.

In addition, I discuss the use of systems intelligence taking into account how control theories in sociology describe people's behavior. I suggest that systems intelligence is a way forward in situations explained by control theories as it asks the important question "how can I improve my life knowing this theory?" It is an essential part of systems intelligence in everyday life to focus on the positive while keeping in mind the negative. That is why a systems intelligent person tries to find something positive in situations she encounters. There is always something positive in a situation or a person. A systems intelligent person focuses on that and tries to improve things. This does not mean that negative things should be

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neglected. Negative effects should be taken into careful consideration but still the focus should be on the positive.

A systems intelligent person does not just think, she acts. It is the basis of systems intelligence to understand that you have the ability to change the system around you. In this case, it is systems intelligent to find out what important knowledge sociological affect control principles can give to people about everyday social events. This can help people to reflect upon their own behavior in the midst of actual situations. In addition to reflecting upon one's own behavior and perceiving the whole situation people might try to act more intelligently in social situations. These are all the very essence of systems intelligence.

Feedback Loops

In understanding the background of control theories in sociology, it is useful to understand the concept of feedback. In his fascinating article "Control Theories in Sociology" Dawn T. Robinson says that system formulations "eschew oversimplified cause-and-effect thinking, while maintaining scientific rigor." He specifies that his article focuses on feedback loop systems developed in engineering. Sociologists have used control theories to explain various sociological questions such as identity processes, interpersonal behavior, social relationships and political and economical systems (Robinson 2007).

Sociologists have used control theories to explain various sociological questions such as identity processes, interpersonal behavior, social relationships and political and economical systems.

Feedback is a typical element in a control system. The feedback loop is called either negative or positive depending on whether it tries to drive the system towards equilibrium or whether it tends to increase the changes that happen. A normal thermostat is a simple example of both a control system and a negative feedback system. A thermostat controls heating to maintain the desired temperature called the reference state. A thermostat increases or decreases the temperature according to the difference between the actual temperature and the temperature setting of the thermostat. (Figure 4.1 on the facing page) A thermostat is a negative feedback system because it tries to maintain and stabilize temperature at the setting value.

A positive feedback loop works so that it increases the deviation from the reference state over time (Figure 4.1 on the next page). Money growing interest in a bank is an example of a positive feedback loop because interest starts growing on interest and the amount of money grows exponentially. The snowball effect is a widely used term which also refers to a positive feedback loop.

Sociology has used control theoretical perspectives for a long time but it was not until William T. Powers' (1973) book *Behavior: The Control of Perception* that control theories had a major impact on sociological discussion. This book introduced the engineering based control system concept to sociology and behavioral psychology. In Powers' theory, human behavior is explained through
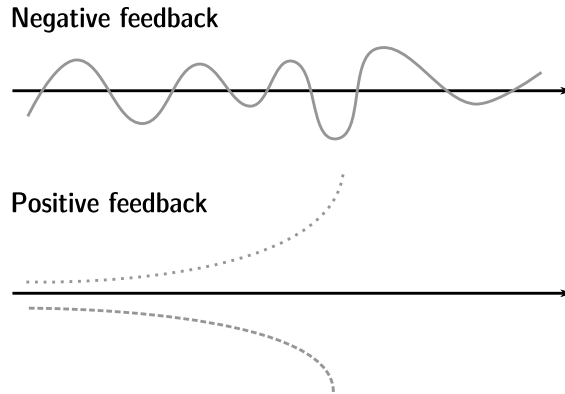
Figure 4.1: The effect of positive and negative feedback.

hierarchical control systems that regulate perception. In his original theory there were nine levels of control systems, but he added two more levels into the theory in 1989 (Powers 1989).

Affect Control Theory

David R. Heise continued from the perception control theory of Powers (1973, 1989) and created another theory called affect control theory (Heise 1979, 2007). The importance of this new tradition is shown by over a hundred subsequent publications. Affect control theory is a theory of social interaction based on empirical data and it has practical applications as well.

On his website[1] David Heise summarizes affect control theory by three basic propositions:

- Individuals conduct themselves so as to generate feelings appropriate to the situation.

- Individuals who cannot maintain appropriate feelings through actions change their views of the situation.

- Individuals' emotions signal the relationship between their experiences and their definitions of the situations.

These principles define affect control theory in a simple way and they provide interesting information about the social dynamics used in systems intelligence. The basic notion of systems intelligence is to view social situations as systems that consist of people's perception, behavior and beliefs of what should be happening.

Affect control theory argues for the primary importance of language and symbolic labeling of situations. It presumes that people tend to develop a way of understanding social situations by using cultural symbols. People tend to define

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[1]http://www.indiana.edu/~socpsy/ACT/index.htm

Table 4.1: Adapted from Heise (2007, p. 8).

EPA Configuration	Identities	Behaviors
Good, Potent, Active	Champion, friend, lover	Entertain, surprise, make love to
Good, Potent, Inactive	Grandparent, priest, scientist	Pray for, massage, console
Good, Impotent, Active	Baby, child, youngster	Ask about, beckon to
Good, Impotent, Inactive	Old-timer, patient, librarian	Obey, observe, follow
Bad, Potent, Active	Devil, bully, gangster	Slay, rape, beat up
Bad, Potent, Inactive	Executioner, scrooge, disciplinarian	Execute, imprison, flunk
Bad, Impotent, Active	Delinquent, junkie, quack	Laugh at, ridicule, pester
Bad, Impotent, Inactive	Loafer, has-been, bore	Submit to, beg, ignore

any situation they encounter with culturally shared concepts and then stick to that definition. Of course, this understanding of situations can and will change over time but it is a basic characteristic of a human being to stick to her first belief.

Affect control theory uses three dimensions of meanings to describe affective responses. These dimensions are evaluation, potency and activity. Thus, any social situation can be placed in a three-dimensional space and measured whether it is good or bad, powerful or weak, lively or quiet. For example, the funeral of someone close to you is a very sad, strong but quiet occasion. Watching a soccer game in your local bar with your friends when your favorite team scores is usually a positive, powerful and lively experience. The values given to events are referred to as sentiments in affect control theory.

Affect control theory offers one way of viewing social situations and understanding how these principles could help people in their everyday lives.

Evaluation, potency and activity are universal dimensions, suggested by Osgood and his colleagues (1957, 1975), to describe affective meanings of social events in different cultures. In addition to events, these dimensions can describe affective meanings of social concepts such as identities, behaviors, traits and emotions. Sociologists have collected lots of empirical data by asking people from different cultures to measure these social concepts by these three dimensions. Evaluation, potency and activity give three dimensional configurations that are called EPA ratings. Examples of different identities and behaviors correlating to different EPA configurations can be seen in Table 4.1. The configuration values of different cultures have been saved in cultural dictionaries so that affect control theory could predict social behavior according to that data.

In addition to these three-dimensional meanings, affect control theory consists of event reaction equations and regulation functions. Event reaction equations describe how different kind of events change the meanings of situations and functions show how we, despite these events, try to maintain the original meanings.

Event reaction equations describe what happens when we have a certain

working definition of a social situation and the situation itself forces us to change this definition. For example, if I am the only one dancing at a party and I start to get strange looks, I will probably stop dancing and even feel embarrassed. These equations are formulated by empirical data of basic social processes and they form the empirical ground of affect control theory along with affective meanings data collected to cultural dictionaries.

The third part of the theory is the control systems part and it works like a negative feedback loop. Affect control theory states that actors try to maintain their working definitions of social situations. So, in spite of events that may change our views on social situations we try to maintain our initial belief. In other words, it is hard to change your prejudices. People's working definition of a social situation is a reference point against which they compare the actual situation and try to correct their affective meanings so that they are in line with the cultural sentiments.

It should also be noted that, despite its mathematical modeling and impression-change equations, affect control theory does not predict precise actions but gives information on different possible responses to events. It only predicts a certain framework for these responses. Clare Anne Francis (2006) puts it this way:

> This feature of theory's control model is based on the recognition that individuals are creative and improvise their actions in response to circumstances, which makes exact prediction impossible. Affect control theory researchers embrace the notion of emergence.

In conclusion, affect control theory consist of sentiments given to social events by people from different cultures and that data is collected into cultural dictionaries. In addition, there are empirically grounded impression-change equations that describe how beliefs change as social situations unfold. The third part of the theory forms the actual control theoretical part and predicts how people try to correct situation dependent impressions with fundamental cultural sentiments.

Systems Intelligence and Learning from Affect Control Principles

As mentioned in the introduction, systems intelligence is more of "knowing how" rather than "knowing what." In other words, systems intelligence is a skill we all possess and use when we "think on the fly", when there is no time to model social situations. In systems intelligence research it is also argued that people's ability to conduct social interaction can be considered quite amazing as human beings possess the skill to do many things at the same time, have the ability to co-operate and, most importantly, are far more often neutral or friendly than hostile towards each other. This ability can be regarded as a sign of systems intelligence.

Esa Saarinen and Raimo P. Hämäläinen first introduced the concept on systems intelligence in 2004 as "intelligent behavior in the context of complex systems involving interaction and feedback. A subject acting with systems intelligence engages successfully and productively with the holistic feedback mechanisms of her environment. She perceives herself as part of a whole, the influence of the

whole upon herself as well as her own influence upon the whole. By observing her own interdependence in the feedback intensive environment, she is able to act intelligently." (Saarinen and Hämäläinen 2004, p. 3)

The concept of systems intelligence has its background in many research traditions such as systems thinking, theories of decision making and problem solving, Socratic tradition of emphasizing conceptual thinking in order to achieve good life, philosophical practice and dialogue and positive psychology. In this context it is clear that affect control theory relates to systems intelligence and that it is interesting from the systems intelligence viewpoint.

The main aim of this chapter is to suggest that if people knew more about social psychology and in particular about affect control theory, it might help them understand social situations in general and make people themselves more self-reflective within these situations. People could be more aware of the whole in social situations, begin the process of acting more intelligently and consider other people in the social interactions of everyday life.

The understanding of social situations using affect control theory proceeds in three steps:

- Recognizing that affect control principles give crucial information about social behavior.

- Reflecting upon social situations of everyday life in the light of affect control principles. That includes reflection on one's behavior and trying to see the whole in social events.

- Contributing positively to social situations by acting intelligently and considering others.

Systems Intelligent Learning: Finding the Gold Nugget

Systems intelligence can be regarded as an invitation for human growth. Hämäläinen and Saarinen (2007, p. 23) say:

> A key point of systems intelligence is its positive emphasis. The perspective highlights what we do right with the idea that we could do more of what's right. The idea is to connect more actively, sensitively and lively with a competence we possess to start with. We are already Systems Intelligent: the point is to be more so.

This idea of doing more of something we already do right can be applied to learning. When people are enthusiastic about something they usually learn it well and, on the other hand, if people do not like something, it usually seems very difficult. Systems intelligent invitation for human growth suggests that people could learn more than they already do by trying to find the Gold Nugget from the things they are learning. This means the ability to find something meaningful in everything: going through a lot of information that might be irrelevant, boring or even fundamentally wrong but still finding something striking, interesting and mind-opening, and focus on that.

In every theory one should find the positive, useful parts of it. This kind of attitude is crucially important to human beings. Rather than continuously finding faults in a person, it is systems intelligent to focus on her merits and try to empower them. Moreover, by keeping in mind that every person is valuable in her own uniqueness, it is a lot easier to treat people with respect and also give constructive feedback when needed.

Rather than continuously finding faults in a person, it is systems intelligent to focus on her merits and try to empower them.

Control theories describe human behavior. Affect control theory is useful in sociological research, but how can it help you as an individual? A systems intelligent person realizes that it is possible to learn something from almost any kind of theory and therefore control theories in sociology are also interesting.

A systems intelligent person knows that any system influences her and she influences the system. She not only *knows* that other people, different cultures and ideas influence her but she also *wants* to be influenced by them and to reflect that influence on others. By comparing new ways of thinking about one's own ideas, one can really invent something spectacular. Therefore a systems intelligent person does not just throw away the chance to, for example meet spectacular people, read a wonderful article, watch a thought provoking movie or in general learn something new. There is always the possibility that you can enrich your life and the life of others by communicating with people and the whole world. That is why it is systems intelligent to always look for the Gold Nugget and discover how you can improve your life after knowing all you know.

Reflecting upon Affect Control Principles

Knowing affect control principles can help people become more systems intelligent in social situations. In order to do so people have to consider whether other people and, more importantly, they themselves really behave according to these principles. Acting in line with affect control propositions raises the question of whether that behavior is good or not. As Saarinen and Hämäläinen (2004, p. 60) put it:

> Systems intelligence begins when the person starts to re-think her thinking regarding her environment and the feedback structures and other systems structures of that environment.

Being constantly aware of one's limitations but still continuously trying to open up is the systems intelligent way of reflecting upon one's own behavior.

Dr. Andreas Schneider[2] widens the affect control theory propositions of Heise and summarizes this theory in seven premises on his website.

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[2]http://www2.tltc.ttu.edu/schneider2/4311spring08/c6_act.htm

1. The affective component of attitudes towards identities, behaviors, traits, emotions, and social settings are most important determinants for the symbolic representation of each event.

2. The affective meaning of identities, behaviors, traits, emotions and settings are called fundamental sentiments.

3. Fundamental sentiments are determined by socialization and therefore depend on culture and subculture.

4. In a given event we try to confirm fundamental sentiments.

5. If we cannot fully confirm identities they will be changed in the situation. We will create a transient impression of this identity.

6. The difference between the fundamental sentiment and the transient sentiment is called deflection.

7. We want to restore the original meaning and minimize deflection by:

   a) Choosing consequent behavior

   b) Labeling: assign new identities to actor or object

   c) Attribution: assign traits to the actor or object

   d) Reinterpretation of the behavior

A systems intelligent person wants to understand premises by questioning whether acting according to these premises is positive or could it sometimes be more intelligent to act differently.

The first and third premise state that affective meanings towards different characteristics have fundamental meanings to social events and that those meanings are acquired through socialization. To a systems intelligent person this information raises the question: "Why do I feel about different things the way I feel and where do my values come from?" This kind of a question helps people understand that if they are in conflict with other people it does not necessarily mean that one has to be wrong and the other right, but different backgrounds of people make them feel differently about things and that is why a conflict can arise.

Premises two and six define the notion of fundamental sentiments. Premises four and five state that we try to confirm our beliefs of situations and that those beliefs are usually shared culturally. The fact that people seek events that confirm their fundamental sentiments is the basis why we have any culture and common habits, and therefore it helps people to communicate with each other. We do not have to consider how to behave in every situation independently but our cultural norms guide us in our day-to-day situations. However, this behavior also makes us conservative and afraid of new situations. Creating transient impressions of situations that are not in line with fundamental beliefs is a sign of systems intelligent action. When one is in a situation that does not match one's beliefs of what should be happening, it is systems intelligent to reframe the situation according to what is actually happening rather than get totally confused. Here

again people could be more systems intelligent and more sensitive to different varieties of social events in general.

The seventh premise states that people try to restore original meanings and they have many ways of doing so. As stated before, affect control theory points out the notion of emergence and thus does not even try to explain precisely what people would do in different situations but sets a frame of actions that people might do. The seventh premise reinforces the earlier premises that explain why cultures can remain stable. People seem to be so eager to stick to their first beliefs that, rather than changing their affective meanings towards identities, they reinterpret the situation so that it reinforces their beliefs. For example, in most cultures mothers are considered good in the evaluation-potency-activity ratings, so when a person sees a mother hitting her child, the person explains the situation to herself by seeing the mother as a criminal or otherwise seeing her as an exception so that the person can still safely use the concept that mothers are well-intentioned. A systems intelligent person, however, might think a bit differently. In some situations restoring the original meaning and minimizing the deflection might not be intelligent behavior. As systems intelligence means acting intelligently in a complex interaction and feedback system, it is vital to be sensitive to what is happening and to be able to reframe one's own view of the situation when necessary.

Saarinen and Hämäläinen (2004, pp. 58–59) discuss the meaning of "mental models" defined by Peter Senge in his book *The Fifth Discipline* (Senge 1990) to systems intelligence. They pay particular attention to the following mental models:

Mental models that relate to one's self-reflective behavior and to meta-level mental models in general. "Can I change my thinking"; "Is there a possibility that my thinking might be one-sided?"; "Where do I adopt the Advocate mode, as opposed to Inquiry mode?"; "What are my key forms of egoism that I legitimate and rationalize as unchangeable aspects of me?"

Mental models that relate to belief-formation. "How can I become more active a subject in the constitution of my beliefs"; "Why do I believe life is not all that miraculous, grand, exciting, full of opportunities?"

Mental models that relate to the subject's beliefs regarding the beliefs of others. "Could it be that she does not convey her meaning accurately in her actions?"; "Could it be that her way of talking hides her true aspirations"; "Could it be that I am misled by appearances?"

Mental models that relate to co-operative possibilities. "Could we succeed spectacularly together?"; "Have we reached the top?"; "What would trigger excitement in others and help us create a magical uplift?"

Mental models that relate to possibilities of human change. "Could I change at the age of 52", "Is mesmerizing love still possible as a trill after all

these years"; "Is my human style fixed at the age of 40?"; "Are meetings in our company necessarily boring?"

Affect control theory looks at all of these mental models from a new perspective. Firstly, people have the habit of maintaining the initially acquired beliefs and definitions that are culturally shared. That helps communication with other people and makes life easier compared to constant change. Still, new ideas, values, concepts and information can be more accurate and better than a person's initial beliefs and culturally shared definitions. So the question is: "Is it possible that in some situations I try to confirm my sentiments rather that see what is actually happening? Should I reframe my view of the situation?"

Secondly, when you think about your belief formation you should also be aware of the major impact of cultural and sub cultural beliefs. Although people tend to look for situations and other people that support their own identities, situations and other people also affect the individual's identity and opinion formation. A systems intelligent person reflects upon her belief formation and realizes that she could think totally differently if she was born in a different country and had different kind of parents, friends and environment. Thus she is more able to evaluate her own beliefs.

The subject's beliefs regarding the beliefs of others is also given new light by affect control theory. If people generally try to correct the deflection between transient situations and cultural beliefs, it means that individual situations are not necessarily given the respect they should be given. Systems intelligently, one should consider whether she is interpreting behavior truthfully or does her experience of earlier situations take over. Consider the case of fellow workers Mark and Dave. Occasionally Dave has been quite nasty to Mark, so Mark stars to think that Dave is always plotting against him. As Dave now tries to apologize to Mark for his bad behavior, Mark might not believe Dave as Mark sticks to his first belief and thinks that Dave's behavior is just a cunning plot. If Mark were systems intelligent, he would not ignore Dave's apology just because he had been nasty before. Systems intelligent person is able to reframe the situation if things change.

According to affect control theory, people's notion of co-operation possibilities is heavily depended on the culture they live in. Thus, if you do not feel like co-operation is very useful and you would not want to try it out with people around you, is it because you really think so or is it just because there is a culture of non-co-operation around you. Usually the creation of a magical uplift is not people's normal state, but it could be. If reference state is at minimum co-operation, it is hard for individuals to create exciting events together or co-operation that creates flourishing emergence.

The last part of mental models considers the question of change. As the affect control principle states, you as well as others have a habit of maintaining your beliefs and so resisting change. You know how things have worked before and how you should behave in different situations. That knowledge helps you to communicate with others. However, it can also be a system of holding back in many situations because normally very few people are tuned to flourishing emergence. People might not talk to each other in a bus, or applaud after a

successful meeting. A systems intelligent person, though, realizes that people could be more considerate to each other and create positive emergence. Just a little smile, a kind word or an encouraging handshake has the ability to make someone feel better. That is why one should ask: "Could I change my behavior in situations where I am used to behaving in a certain way?", "Could I contribute socially so that someone would feel better?"

Acting Intelligently in Social Situations

The systems intelligent perspective emphasizes the importance of action compared to mere thinking. Therefore it is relevant to consider intelligent action in real social situations that affect control theory describes.

Systems intelligence can be regarded as a way towards good and improved human life (Saarinen and Hämäläinen 2004, p. 55). Their article states:

> Systems Intelligence is about the betterment and improvement of human life. The idea is to take the ancient promise of philosophy seriously, the one that called for the Good Life, and to use a systems approach to the benefit of such a process.

In other words, systems intelligence is action to produce change that has a positive impact. In a social context it is systems intelligent to perceive the whole situation and to try to contribute in a way that changes the direction of unfolding happenings towards the better. For instance, one could suddenly say something positive to ones companion in the middle of an argument. This unexpected behavior might remind the arguing companions that they do love one another. This is what people usually forget when they are angry. Such an intervention could eventually help to stop the whole fight.

As affect control theory states, people in every culture have sentiments for every social concept or situation. These sentiments can be estimated by three values which were evaluation, potency and activity. It is not enough just to know that people label situations according to those statements. Systems intelligence emerges when one tries to figure out why people think that some concepts are not as good as others. Learning about labeling in different cultures and different times may lead to an understanding that this is not the whole truth. People could think more positively about normal situations such as meetings or lectures. The systems intelligent viewpoint encourages this kind of positive labeling of situations.

Just a little smile, a kind word or an encouraging hand shake has the ability to make someone feel better.

Most situations such as waking up, going to work by bus, having meetings, buying food from the local store and meeting friends are neither good nor bad, but neutral. Nevertheless, a person acting systems intelligently tries to create positive situations in everyday life and make neutral events better. Both systems intelligence and affect control theory perceive that situations, objects or concepts are neither good nor bad but people label them such. Labeling also differs

according to time, personality and culture. Therefore it is possible to look things
from different viewpoints and try to find positive sides to every event. For example,
people could view lectures as a wonderful opportunity to learn about this world
we live in rather that boring events that one must get through. Meetings could
be considered an exciting opportunity to form new ideas with people and taking
a bus home from work as a relaxing moment to daydream. This is how people
can attach positive labeling to culturally neutral situations.

There is an example of a boy in a film "Pay it forward" (Mimi Leder 2000)
who understands that if one person does a good deed to three other people and
they all pay it forward to three more, eventually the amount of good things done
to people will grow exponentially and be enormous. Sadly the story is not very
happy and, in real life, paying it forward does not often gain results. Even if most
people want good, a good outcome does not always result. This phenomenon is
regarded as a system of holding back in the systems intelligence vocabulary.

As Saarinen and Hämäläinen note, systems can
produce outcomes that nobody in the system ac-
tually wants. That is because, in addition to the
structure that produces behavior, also beliefs about
the structure and beliefs regarding the others' beliefs
about the structure produce behavior. This means
that even if all the people would like to have more
joyful interaction with each other, it may not happen
if everyone thinks that others want to maintain the
present state. If everyone believes that all other peo-
ple think that meetings should be very strict, strict
meetings become reference state and according to af-
fect control theory, everybody continues to maintain
that state. Thus, the state that is not wanted may

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to maintain the present
state.*

become standard in the social context. A systems intelligent person realizes this
possibility and tries to avoid it by being aware of the constant hold back systems
in our life. One focus of personal systems intelligence research is to find out what
kind of interventions have the desired impacts and which interventions have no
impact at all.

A great example of a systems intelligent act of positive social contribution
is the way Professor Saarinen begins his lectures[3]. He has a habit of shaking
hands with every person coming to his lectures. Even if there are two hundred
people, he will look into the eyes of them all, shake their hands and smile. The
handshake provides a warm moment and will give a nice feeling to many of the
participants. Someone participating in the lecture might have had a very bad
day. Maybe she remembers the nice handshake for the rest of the day and feels
a lot better, and will get much more out of the lecture. An introduction is not
very resource consuming, either. It does not take a lot of time to shake hands.
Moreover, Saarinen probably gets energy out of hand shaking himself, too. This is
a striking example how reframing the system of a lecture and making it a socially

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[3]This example is only one aspect of philosophical lecturing. See also Slotte and Saarinen
(2003), especially pages 10–14.

positive contribution can give energy to both the participants and the lecturer. In this example a minimal input has the possibility to make a large positive impact.

Systems intelligence is more about acting intelligently than about thinking intelligently. That is why systems intelligent research is interested in how affect control theory can improve people's day-to-day communication and improve their lives. As those principles give important information on how such systems work in social situations, a systems intelligent person may learn from them and then make her positive contribution.

In addition, affect control theory gives enriching vocabulary to systems intelligence research. Saarinen and Hämäläinen refer to phenomena such as "systems of holding back" and "structure produces behavior". Affect control theory notes that people label situations according to their culture and try to maintain the reference state they have in social situations. The latter description is very important and it views social situations from a different viewpoint. Thus affect control theory principles should be taken into careful consideration in systems intelligence research. Understanding the essence of human behavior in social situations may help each individual to act more systems intelligently and empower flourishment in daily situations.

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Alexander, Architecture and Systems Intelligence

Maija Ojala

Architecture is basically about relatedness, as is systems intelligence. Christopher Alexander is an architect and a scientist who has argued the case for a living and profound connection with our built environment. Systems intelligence suggests perspectives on living in complex systems. In this chapter I will study the interconnections of systems intelligence and Alexander's approach, suggesting that they share certain key convictions. Both provide powerful perspectives and tools for the study and practice of architecture.

An Introduction to Alexander

CHRISTOPHER ALEXANDER WAS born in 1936 in Vienna, Austria, grew up and studied mathematics and architecture in England, and received his doctorate at Harvard University in the U.S.A. In 1963, after working for some time at Harvard and at MIT, Alexander became professor of Architecture at University of California at Berkeley, where he taught continuously for 38 years.

Alexander's first book *Notes on the Synthesis of Form* (1964), although about architecture, also influenced the study of artificial intelligence and programming language design in computer science during the following decades[1]. Starting in the late 1960s Alexander developed his "pattern language" idea (Alexander 1979, p. 186), creating a generic and extremely adaptable pattern language for building in different scales. He developed the concept in *The Timeless Way of Building* (1979), presented (with other writers) the patterns with thorough comments in *A Pattern Language* (1977) and reported the appliance of his theories in real building projects in several books, e.g. *The Production of Houses* (1985).

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[1]In fact, this may relate to the phenomenon, confusing to an architect, that searching the databases in the Internet with the word 'architecture', you end up with a lot of references to computer science and astonishingly few to building. It may be that by adopting Alexander's ideas in the programming language developments people seem also to have adopted the word architecture to replace concepts like structure, constitution or layout. Maybe this highlights the focus not only on forming structures, but structures with internal coherence and grace.

The central ideas in Alexander's theory include insisting on people's own ability to build their houses, neighborhoods, and even towns: "The people can shape buildings for themselves, and have done it for centuries, by using languages which I call pattern languages" (Alexander 1979, p. xi). "Once the buildings are conceived this way, they can be built, directly, from a few simple marks made in the ground – again within a common language, but directly, and without the use of drawings" (ibid., p. xiv). "These pattern languages are not confined to villages and farm society. All acts of building are governed by a pattern language of some sort, . . . " (ibid., p. xi). "Finally, within the framework of a common language, millions of individual acts of building will together generate a town, which is alive, and whole, and unpredictable, without control" (ibid., p. xiv).

Alexander studied and sought out examples of timeless, comforting and even nourishing features in every level of the human built environment, from cities to houses, from interiors to ornamental details. He then formed a collection of 253 patterns that could be used in a generative way in creating better environments for people. The inhabitants or users would participate in every stage of this gradual planning/building process. The patterns would work in a hierarchical structure, always based on the particular conditions of the site, but forming a networking system, that would at every stage offer several choices for advancing. Thus, every house would be both similar to the nearby houses and totally unique, depending on the set of patterns chosen for each individual enterprise. Alexander compares this pattern language to spoken languages, where every individuals usage of the language is unique, although all share the same grammar and basic vocabulary.

Alexander's approach was strongly opposite to the mainstream attitude towards building and architecture of those years. The building industry was impregnating the market with standardized, mass-made building parts, the scale of housing projects was increasing at the same time as the time resources for planning and building were decreasing, and the faith in the superiority of the new solutions reigned. The profession of architecture was getting more and more divided between urban planning on the one hand and the design of buildings on the other. The connection between the future users and the planners and designers had deteriorated, excluding maybe the commissions of wealthy house-builders (and even they sometimes had to fight to get their views accepted by the architect!). But very few professionals saw a real possibility of returning to local decision-making, self-help housing, and hand made details, which seemed indispensable when applying Alexander's patterns.

No wonder then, that Alexander's views did not at first gain the attention and effect they could have. I recall, when first making acquaintance with Alexander's writings in the 1980s, a distinct sadness over the fact, that these books were not compulsory reading for every designer- and planner-to-be. Yet I feel Alexander may have contributed to the negative reception of his ideas by objecting too one-sidedly to all authorities and to all official planning. Alexander's thoughts on building did, however, win numerous followers throughout the world, and over the years his work has not only taken a firm position in the theory of architecture, but also affected and enriched the practices of the profession.

Towards the end of the 20th century Alexander continued his practice and carried out further research and development concerning his theories. In this

millennium he has collected his legacy of a living environment in a four volume series *The Nature of Order*. Alexander's work still continues, maybe even on a broader basis than before. Besides his books, his teachings are nowadays available to a wide public via the Internet (www.patternlanguage.com). In this latter forum Alexander has developed the concept of patterns into a more flexible system of sequences. He has also conformed to some restrictions of our institutionalized society, offering people tools, not only to work without authorities, but also to work with them.

The Nature of Order

In *The Nature of Order* Alexander states his fundamental findings and elaborates on them with many examples, using both text and pictures. The key concepts include:

- The concept of Life, as a quality: "a general condition, which exists, to some degree or other, in every part of space: brick, stone, grass, river, painting, building, daffodil, human being, forest, city." (*The Phenomenon of Life*, p. 77) Alexander suggests that people are in agreement about the "feeling of life", and irrespective of their culture, age or education, when confronted with spaces or artifacts.

- The concept of Wholeness, existing in space and modellable in mathematical terms. "The wholeness is created by parts; the parts are created by wholeness" (ibid., p. 84). Wholeness is a character of things, and is something deeper than features (ibid., p. 96).

- The concept of Centers, as organized of zones of space. "Centers are coherent entities, often marked by local symmetry, by differentiation, by the presence of a boundary, and by convexity, which co-operate to cause a field effect." (ibid., p. 121)

- The concept of a Living Structure: "A structure gets its life according to the density and intensity of centers which have been formed in it" (ibid., p. 110). Alexander proposes that a living structure impacts human life by enhancing the feeling of freedom. In volumes 2 and 3 Alexander discusses the ways in which living structures can be created.

- The list of 15 properties that allow centers to help each other. These are described in detail in chapters 5 and 6 in *The Phenomenon of Life*, and their use as a tool of design and planning is further developed in volumes 2 and 3.

- The nature of order as something personal, as a way of including the "I" in the world-picture: "... ultimately we must understand the awakening of space, which occurs when a center gets more life, as a measure of the degree to which that center becomes associated with the human 'I', or self." (ibid., p. 439). In volume 4 Alexander elaborates on the understanding of space as a material that is capable of this awakening.

In the four volumes on the *Nature of Order* Alexander thus proposes a new coherent basis for nothing less than all of Architecture; "a platform which gives architecture new content and meaning" (ibid., p. 442). This is a bold enterprise that aims to salvage architecture from the alienation caused by modernism.

After decades of work, Alexander's message is getting through: e.g. Nyman (2006) suggests in his thorough review of these four books that Alexander may be the most important architectural theorist of the past century, alongside Le Corbusier.

Le Corbusier argued for disconnecting architecture from its past history and developing it towards an "independent art". According to Diane Ghirardo (1996, p. 9) "... the ideas of most Modernist architects retained as an underlying constant a belief in the power of form to transform the world, even if it was usually linked to some vague broader goals of social reform". Thus in practice the human conditions were often overpowered by formalism. In much of the modern architecture this negative attitude still prevails and is something that should be rejected.

Against all dehumanizing tendencies in architecture, Alexander urges for a return back to the people, or in other words, to get the human perspectives back as the central premises of architecture. We may not agree with all the methods he proposes or we may be doubtful as to what extent he succeeds in bringing the theories into practice, but we must agree that the aim is just, the effort is thorough and enormous, and the message is well worth hearing (see also e.g. Kruft 1994, pp. 443–444, Johnson 1994, p. 98, and Farmer 1993, pp. 334–335).

Architecture as a System

Architecture is a word of many meanings (see footnote 1 on page 65). According to the dictionary[2] it is used varyingly to describe the art, practice, or profession of designing and erecting buildings. It can also mean a particular method or style, or refer collectively e.g. to all the buildings of a place. Sometimes it is used to describe a quality, as in distinguishing a "noble" building from a "profane" one. All these aspects, and more, are simultaneously present in the ambiguity of this one concept.

The many realms in which architecture operates and draws from add to the difficulty of grasping its fundamentals. Architecture seems to spread out in many different directions and it appears to overlap with even contradictory fields of study and aspects of everyday life. Architecture seems to be distributed "all over the place". We can, of course, focus on different aspects of architecture, for instance, by restricting attention to the differences and similarities between architecture and other arts, or by conducting technical research concerning new (or old!) construction products and methods, or by discussing the interaction between man and the built environment. All these activities shed light on some part of the whole, but they do not address architecture in its entirety. Architecture, in its entirety, is a challenging phenomenon to grasp.

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[2]The Penguin English Dictionary, 2nd Edition, 2003.

Hämäläinen and Saarinen (2007b, p. 53) define the principal features of a system as follows:

- A system is characterized by the interconnections of its elements, as well as by the internal nature of those elements.

- A system has generative power. It produces effects beyond the modes and functionalities of its elements.

- A system has primacy over its elements while at the same time the elements influence the system.

- A system has emergent features, not reducible to the features of its elements.

Architecture, in each and every interpretation of the concept, is indeed characterized by the interconnections of its elements. Architecture could be conceived as a large system including a lot of sub-systems that each operate according to their own inherent laws. These laws can be exact and clear, like many of those in the field of physics. They can also be restricting, inexplicit, causal, implicit, statistic, probabilistic or whatever, but they do expose and conduct the way things happen in these systems and thus also have an effect on the whole.

Architecture also certainly produces effects beyond the modes and functionalities of its elements. Even in a small and simple building task many features come about besides those that are proposed in the beginning and those that are actually handled in the processes or subsystems of architecture. I have discussed some of these aspects in my previous chapter (Ojala 2007), where I examined architecture from the viewpoint of leadership.

In the perspective of the "primacy of the system over its elements" we actually touch a major problem in the field of architecture. When a subsystem of architecture takes the leading position, we may get results that are severely one-sided. Thus, overly focused economical efficiency can produce monotonous and depressing housing districts, while overly art focused architecture can produce spaces that are improper for their intended use, and so on. In architecture, and again in the many meanings of the concept, the primacy of the system over its elements is not only a feature, but a crucial precondition for its existence.

This is true likewise to the emergent elements in architecture. Every room must be more than the cubic meters it contains and the quality of the surfaces that surround it. Every home must be more than a set of rooms where to perform the necessary acts of dwelling. And if a building can be reduced to its elements, it is just engineering, not architecture. It may be necessary to point out, that I am not speaking of ornament here, although ornament may be an instrument to achieve what is wanted. What I am aiming at is a spirit or an atmosphere, something maybe undefinable in words, but intelligible to the people who visit or use these spaces.

It seems natural therefore to regard architecture from the systemic point of view. In fact, it may well be the only perspective through which some kind of general and holistic understanding is forthcoming concerning architecture. It will be an interesting task to survey the subsystems of architecture and their

interconnections and dimensions, but for the purposes of this chapter I will focus upon some key systemic aspects of architecture.

Operating Inside Systems

In systems research we find many tools to learn about systems and to operate with them. Systems thinking is a valuable asset when operating with complexity (Richardson 2004, Jackson 2006). A key feature of architecture is that it includes a number of different parties and stake holders with different kind of needs, hopes and aspirations (many of them implicit). In order to cope with the kind of complexity that emerges in architecture, it seems that we need a framework where we can operate without the misconception of "knowing it all" or "having total control".

Systems intelligence is a newly developed concept that has its roots in philosophy and mathematics, especially in systems theory. It was formulated in 2002 and introduced in 2004 by philosopher Esa Saarinen and mathematician Raimo P. Hämäläinen in "Systems Intelligence: Discovering a Hidden Competence in Human Action and Organisational Life".

Systems intelligence is neither an explicit theory nor a new type of paradigm. It is more like an umbrella concept which allows us to interpret familiar phenomena from a fresh and intuitively appealing perspective. It highlights a competence humans have used since very early times. The key idea is to focus upon "our systems endowment, the human systems intelligence we possess as human beings" which is "far more than ability to think about and know about systems" (Hämäläinen and Saarinen 2007b, p. 296). We live within and with respect to systems, we act and react in them, we emerge through systems – and systems intelligence is the ability to operate intelligently in the midst of such systems even in the absence of explicit knowledge of what the systems in question might be.

Thus the perspective of systems intelligence

> ... takes the pragmatic intelligence of us humans as its starting point, seeking to highlight what we do right even when we do not know exactly why it is right or know for sure if it will be right – all that in contexts of dramatic, perhaps humanly impenetrable complexity. Systems Intelligence approach, in other words, seeks to connect two distinct intellectual and life-orientational paradigms: the tradition of rationally controlling, engineering and commanding complex structures, and the tradition of sensing, experiencing and sharing the subtleties of one's environment through human connectivity and the subjective dimension. (Hämäläinen and Saarinen 2007a, p. 5).

Systems intelligence does not turn its back on objective realities, quite the contrary. In the work of say an entrepreneur, an architect, or a builder it is always vital to command as much relevant knowledge as possible, and especially not to dismiss any inconvenient truths. But systems intelligence also takes seriously the fact that no amount of information can ever yield perfect knowledge. And whatever may seem complete at the beginning of a process, will soon fade as change takes over.

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Systems intelligence pays particular attention to human perspectives and sensibilities. People come to situations with feelings, intuitions, hopes, likes and dislikes, and all these are present and active in decision making, in interaction, in the forming of interpersonal systems. An external, object-based systems outlook may easily overlook such matters as irrelevant, and in the context of architecture may for instance focus on the objective dimensions of the building process. A more complete understanding of architecture cannot overlook the human dimensions, however; this is one of the reasons why the systems intelligence perspective is so useful in the context of architecture.

Systems intelligence approach has been applied to architecture in several chapters of systems intelligence books. The chapters have discussed the built environment from the viewpoint of a planner (Lahdenperä 2006), architecture and leadership (Ojala 2007), the concept of a home (Tervo 2007), the aesthetic interrelation between persons and their environment (Tallberg 2007), and the design of learning environments (Alho-Ylikoski 2008). In this chapter my aim is to extend the perspective further by opening a dialogue between the work of Christopher Alexander and the systems intelligence approach.

The Loss of a Relationship – and the Re-Creation of It

One central concept in Alexander's *Nature of Order* is Life. Alexander proposes that this property exists in some degree in every material object in our environment and that it is possible for each of us to recognize it.

The phenomena underlying Alexander's concept of Life-property and the concept of systems intelligence are both as original and basic as humanity itself. As mythical and religious stories of the origin of humanity tell us, in the very beginning of humanity people began to be aware of themselves, as part of and yet as separated from the "outer" world. They started to experience themselves as similar to, but still separated from the other beings that share this self-awareness. Research into the developmental stages of an infant show that something similar happens in the early months and years of the human life. In his groundbreaking book *The Child's Conception of the World* (1929/1972, p. 167), Jean Piaget writes:

> In fact, during the primitive stages, since the child is not yet conscious of his subjectivity, all reality appears to be of one unvaried type by reason of the confusion between the data of the external world and those of the internal. ... From the point of view of causality, all the universe is felt to be in communion with and obedient to the self. There is participation and magic. The desires and the commands of the self are felt to be absolute, since the subject's own point of view is regarded as the only one possible.

A baby thus expects her surrounding world to supply her everything she needs in a matter-of-fact and natural way. To her the environment is a living entity that she herself is a part of, and although she encounters different phenomena – varying light, floating faces, different kinds of sounds, changes in temperature and so on – they all belong to the seamless whole she herself is a part of. Only

gradually does she become aware of separate entities, some of which are hers – as in the miracle of a baby finding her fingers!

Even before the baby can separate herself from her surroundings, she acts and reacts, she adapts to and brings about incidents in her surroundings. She acts with inherent systems intelligence. It is a vital skill for a baby to be able to act intelligently with a system she knows almost nothing of. The baby is an active partner in what Daniel Stern has called "the interpersonal world of the infant" (Stern 1985), and with her systemic endowment she is to survive and get a chance to grow up and flourish.

To a very young child the environment is still a very living entity, even after she gradually grows to the awareness of her being separate from her environment. She associates feelings and personality to objects, she senses characteristics in her environment and she even feels that her emotions can have real effect in the material world. (For a description of the stages of the child's development according to Piaget, see Piaget 1929/1972. For some more recent discussions, see Stern 1985 and Hobson 2002). This magical relationship of immediate connectivity with the world is later lost. We might also get alienated from our environment and from other people as we learn life's "realities", gear towards an objectifying and materialistic world-view, and become distrustful of our bodies and our feelings. There are, however, even in our western – so called advanced – cultures some sensitive people, who keep something of this magical connectedness with the environment in them, even in adulthood. I am sure we find them for instance amongst artists.

I suggest that Alexander's concept of Life is about this living connectedness with our physical environment. Just as systems intelligence is a phenomenon and a capability that expresses itself in what Hämäläinen and Saarinen call "the human in-between", the emergence of Alexander-like Life-property is something that comes about in the interaction between human beings and their physical environments. It points to a capability and sensitivity that we possess to begin with, but which may languish, because there is so little in our modern lives to support, encourage or nourish it.

Around the world many cultures have been found which have lived in a closer connection with their environments than that which is usual in the western world. Not yet overpowered by our "civilization", many "primitive" cultures have preserved much more of the living connectedness with their material world. In his book *Language and Myth* Ernst Cassirer (1953) discusses many native cultures of both Americas, Australia, Africa, and Asia and quotes ethnologists that have gathered a vast data and numerous examples about a very different notion of man's place in the big picture of Nature and about the very different nature of this interaction.

Cassirer gives a compact and clear account of what he calls "the mana-taboo formula" of native people. Cassirer is tracing the phases of religious thought and the mana-taboo formula is regarded to be the "minimum definition of religion". According to it, there are places or persons that possess so much of the positive (mana) or the negative or dangerous (taboo) property which transcends all nature, that they can and must be separated from everyday life, and thus become "holy" or "cursed" (Cassirer 1953, pp. 62–73).

This pre-religious formula is thus preceded by the "notion of a universal, essentially undifferentiated Power", which is called with many different names in different parts of the world: "mana" by the Melanesians, "manitu" by the Algonquin (an Indian tribe of North America), "wacanda" by the Sioux (ibid.), "orenda" by the Iroquois (ibid.), "mulungu" by the Shambala people in South Africa, and many others (Cassirer 1953, pp. 64, 69). These concepts were usually interpreted to be parallel with the concept of the Christian God[3] (Christian missionaries were often the first people to study these cultures). Such a straightforward interpretation, however, passes the impersonal, indefinable and unclassifiable nature of the concept. Cassirer quotes Söderblom in his treatise:

We are dealing here with a worldview where "how" matters as much as "what".

> The words in question (mana, manitu, orenda, etc.) have ambivalent meaning and are variously translated as remarkable, very strong, very great, very old, strong in magic, wise in magic, supernatural, divine – or in a substantive sense as power, magic, sorcery, fortune, success, godhead, delight (Cassirer 1953, p. 66). Even the attempt to determine the wordclass to which these words would belong seems to encounter major difficulties – indeed, no English sentence of reasonable length can do justice to the idea of the words in question (Cassirer 1953, pp. 67, 69).

Clearly the idea behind these words is very similar to each other, no matter where or under what name this conception is found. We are dealing here with a certain type of mental attitudes; a worldview, where "how" matters at least as much as "what". The same attitude is found in many eastern religions and cultures. I propose that these old concepts comprise very much the same fundamental aspects as that which Alexander's Life-property is all about (Alexander himself makes indications towards this direction, if only in endnotes. See *The Phenomenon of Life*, pp. 62, 444). Alexander is thus focusing on an age-old phenomenon and bringing it to the present, as well as trying to define it explicitly and scientifically.

If we take the position that the understanding of the Life-property, the deep knowledge of our connectedness with everything else in nature, is a basic human quality, which we have to a great extent lost, we face two direct consequences. Firstly, we have at least a partial explanation for the overwhelming feeling of alienation that seems to corrode our modern cultures. Secondly, what we need is, not so much a new way of thinking, but rather to resuscitate an already existing one, which is only hiding.

Hämäläinen and Saarinen (2007b) state in their essay "The Way Forward with Systems Intelligence":

> Instrumental reason has created techniques and technologies that are superbly efficient in increasing productivity, efficiency and well-being

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[3]See also Piaget 1929/1972, pp. 169–170.

in separate segments of life. Taken together, they create a clear and present danger – a system of destruction – for living on planet earth.

The belief of man's power over nature may prove to be one of the most destructive ideas that mankind has ever fostered. Many innovations have furthered the well-being of mankind, or at least the well-being of some part of mankind. It also seems however, that every new accomplishment has come at a price; a price that is to be paid gradually and with potentially devastating effects in the long run, in a form that is hard or impossible to predict. Every action that mankind takes, which is not in harmony of with the life-supporting systems of nature, will backfire sooner or later.

James Lovelock's justly famed book *The Ages of Gaia* (2000) he gives a thorough account of the impact of humans on the systems of earth. As long as mankind possessed only a minor role in the big picture of nature, nature on earth could survive and eventually heal the traces of human activity. But with the means the mankind possesses now, the total balance of the planet is at stake. According to Lovelock, this is not likely to be fatal to planet earth, which will survive by adapting to the catastrophes that may follow, but it may well be fatal to many species living on this planet, including humans.

It is clearly high time that we learn anew the ways of living in harmony with nature and with ourselves. It is high time we started to appreciate "the life" in us and everywhere around us, and start to act more systems intelligently with the systems that sustain life. This does not mean that we should, or could, step back in time. We have to meet the demands of our time with the answers from our time. Taking this into consideration we must include in the processes of our time the understanding of our

We must revitalize our connectedness with nature as well as our need of meaningfulness and beauty.

deep connectedness with nature, as well as our inherent need of meaningfulness and beauty. I find that this is the very core also in the teachings of Alexander.

Alexander vs. Systems Intelligence

The overlapping themes in Alexander's work and in the concept of systems intelligence are numerous and very central to both views. In fact, these concepts overlap so much, that I am almost tempted to see them as two sides of the same coin. Alexander is dealing with the interaction of human beings with their environment, including other human beings. Hämäläinen and Saarinen, are dealing with the interaction of human beings with other human beings, whilst also including the physical environment.

Both approaches believe in the inherent ability of humans to act intelligently in their surroundings and to shape their environment for the better, *with the wisdom, knowledge and sensibilities they already have in them.* This does not mean underestimating learning or acquiring skills, but it unambiguously denies the depreciation of people's tacit knowledge and sensibilities.

Both views are also concerned with what the prevailing systems actually generate – and press the question as to what extent what we get is what we really want. "It's not what the vision is, but what the vision does" (Hämäläinen and Saarinen 2007, p. 21). And just as systems intelligence has at its core "this call towards flourishment" and the wish to "elevate our everyday actions in the right direction" (ibid., p. 16), so does Alexander's work strive for the same goals.

Systems intelligence is about tuning into the realm of human details, taking them seriously and building a connection to bigger entireties in a way that is functionally relevant. I find this a very good phrase to describe the central content of Alexander's approach as well. Both views aim, likewise, to getting people fully connected with their inner potentialities and energies.

Both Alexander and systems intelligence believe in the inherent ability of humans to act intelligently in their surroundings and to shape their environment for the better, with the wisdom, knowledge and sensibilities they already have.

Both approaches also share a particular way in combining what seem like contradicting goals. Alongside with "developing a system of focus" there is also a demand of developing "a system of staying open" (Hämäläinen and Saarinen 2007, p. 22): it is essential to pay attention to what is emerging. Sensitivity, holism, and constant adaptation to the constantly changing situation are key features in both approaches.

There are important differences, too. One of these has to do with the time factor. As I stated in my previous chapter, architecture is a profoundly slow art. Time is an essential factor in every phase of architecture. (Ojala 2007, p. 137). Where systems intelligence demands instant mental agility and quick reactions, Alexander's way of interacting with the environment is more gradual and slow. It calls for profound consideration, continual experimentation, and going deep into the qualities of the place. Just as the changes in nature are gradual and evolving, so should the changes be in our environment. Rapid and extensive changes are, as well in nature as in our built environment, most likely to be catastrophes.

Another basic difference is the degree of inherent openness in the approaches themselves. Alexander sees the need for constant flexibility in the unfolding of the environment and of any one building. In his theory, however, he strives to form a solid and all-embracing structural discourse that somehow would include *all* the things that matter. This tendency towards One Ultimate Truth may reflect his personal history as a mathematician. In this perspective Alexander's theory seems to belong to the objectivistic paradigm unlike systems intelligence, which chooses to stay open even in its own definition.

In the same way there is a significant difference in the degree of commitment that is demanded. As Stenros (1990) observes in her essay "Making a building which is like a life lived", the application of Alexander's (earlier) theories tends to demand the acceptance of the whole system, and thus the results can only be evaluated inside this system. Although Alexander has developed and widened his approach, I feel the same undercurrent is still there.

With systems intelligence, however, it is perfectly legitimate to use the approach in a piecemeal way. It is not even crucial to know why something works. If something works in practice, it can be taken as a starting point to bring about more of the good to the world. There is considerable trust in systems intelligence in small, incremental and even accidental interventions.

Tools for Architects

For an architect both approaches can offer some practical and powerful tools. Alexander's theory seems to perform at its best when used to analyze the built environment, and likewise in the completing or healing of an unsatisfactory or lacking built environment. It has also generated very convincing results in the field of building one-family houses.

Despite this, in the creation of wholly new areas serious problems can be seen to be raised both in the handling of larger entities and in the execution of individual buildings. Large projects include so many participating agents, and the commitment of all of them can hardly be as total as the application of Alexander's theory would demand. In a one-family house project people are more likely to be very committed and willing to put extra hours and/or money in the building of their dreams.

Handling the unfolding of a larger entity also seems to need a "master mind" to tie up all the different aspirations, in order to produce a fully functional and satisfactory architecture. No architectural system, however complete it strives to be, can rise above its constituent parts in the absence of an extra input that "breathes the spirit" into the whole. Maybe Alexander's point is that the "master mind" should emerge from the individual minds working with due sensibility to the demands of the "pattern language". But one is left wondering, how such a process could actually evolve in the presence of a number of stakeholders and parties with non-identical interests.

Systems intelligence, of course, does not directly offer any tools for the actual practice of architecture. It does, however, work very well in e.g. analyzing the subsystems of architecture, both in theoretical and practical aspects. It is also a fruitful perspective in studying the interaction between people and their environment on many levels, as previously mentioned. The most powerful contribution of Systems intelligence to the field of architecture could still be in its lessons about human interaction.

Architects work with other people at every stage of design, planning, and construction, but today it often seems that architects lack the capability to communicate genuinely with the other parties. The vocabularies of architects, clients, constructors, officials, and users seem to differ considerably, causing constant problems. Systems intelligence could help to develop better practices for the co-operation of the participants, to ensure that the "flourishment potential" of architecture is not lost in misunderstandings.

Conclusion

In much of the everyday building practice today, the demands of art and nature and even those of basic humanity are often overpowered by the interests of technology and the economy of efficiency. To be able to turn the processes towards healthier and more holistically life-enhancing directions, we need more knowledge about the human connectedness with nature, and about the preconditions of our human well-being. The approach of Christopher Alexander and that of systems intelligence can both point us in critical directions, and inspire relevant research.

To be able to get real functionality out of the theories of architecture, we also need to bring these studies to bear on the actual practice of architecture. This has been Alexander's life-long mission, and it certainly has been a grand and glorious one.

Systems intelligence provides us with one platform to conceptualize the task. It offers us new perspectives, and new tools. With its emphasis on sensibilities beyond those of objective knowledge, systems intelligence, like Alexander, seeks to create more room for humanity in the world of architectural systems.

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CHAPTER **6**

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Systems Intelligent Homiletics

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Miikka Niiranen

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This chapter focuses on sermon from the point of view of systems intelligence. The narrative aspects of the functioning of the human mind are discussed, as well as theological themes such as bridal mysticism as applied to the systemic in-between. The systems intelligence perspective is found to be a useful framework to illuminate some key features of a successful sermon.

Introduction

SINCE THE VERY DAWN of Christendom speech has been an essential feature of congregational life. We can imagine the moved apostle Paul giving the touching farewell speech to the elders in Ephesus after teaching "everyone night and day with tears" (Acts 20:31), Peter rising to defend the gentiles' right not to be circumcised (Acts 11:5–17), as well as the famous missionary speeches of both of these apostles, first in Jerusalem (Acts 1:14–40) and then among "all nations" in Areopagus (Acts 17:22–31). These and other influential oratorical acts set a standard and they remind us of the potential significance of oratory and speech in the context of Christian spirituality. In the centuries to follow, much of the congregation life took place via pastors[1] whose task it was to teach orally the way of the Lord, and transfer His teachings into the present day using speech.

But how far can a preacher go in the art of rhetoric? Saint Augustine seems open-minded and pragmatic on this question, urging for the use of oratory[2]. In Chapter 7 of the fourth book of *On Christian Doctrine* (1887) he thoroughly explains some of the classical means of rhetoric the apostle Paul uses in his letters: *gradatio*, *ambitus sive circuitus* etc.

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[1] According to Lutheran Augsburg Confession, the pastor's office is a divine institution, set by the Lord himself. See CA V.

[2] From *On Christian Doctrine*, Chapter 2: "Now, the art of rhetoric being available for the enforcing either of truth or falsehood, who will dare to say that truth in the person of its defenders is to take its stand unarmed against falsehood? For example, that those who are trying to persuade men of what is false are to know how to introduce their subject, so as to put the hearer into a friendly, or attentive, or teachable frame of mind, while the defenders of the truth shall be ignorant of that art".

Bringing the question closer to us, one could ask if a preacher can have totally free hand in deciding on the means he can use in the service of the increased effects of his speech. Is he free to exploit technologies and all the special effects possible? Can he use insights and knowledge of communication theories, psychology, performance arts, etc, in his homilies? Is there not the danger that the eloquence of the speech might become more important than the content, thus potentially threatening what the sermon as a system is ultimately supposed to be? Surely do we want to see reverends sacrifice their spirituality for the sake of oratorical impressiveness. In a sermon, spirituality should be the core, and everything else should serve that core in the system that ensues.

In this chapter I shall prose a perspective on sermon, which

1. Perceives sermon as a system, i.e. a whole the parts of which are integrated and affect one another, giving rise to emergent phenomena;

2. Discusses the pastor's actions within that system from the point of view of systems intelligence.

Raimo P. Hämäläinen and Esa Saarinen define systems intelligence in their article "Systems Intelligence: Connecting Engineering Thinking with Human Sensitivity" (2004) as follows:

> By Systems Intelligence (SI) we mean intelligent behaviour in the context of complex systems involving interaction and feedback. A subject acting with Systems Intelligence engages successfully and productively with the holistic feedback mechanisms of her environment. She perceives herself as part of a whole, the influence of the whole upon herself as well as her own influence upon the whole. By observing her own interdependence in the feedback intensive environment, she is able to act intelligently.

In this chapter, I approach the systems intelligent sermon as one that serves intelligently the key purposes of a sermon. In a systems intelligent sermon the parts of the system integrate intelligently to yield spiritually relevant outcomes.

These outcomes include an increased awareness of the finiteness of man, a need of redemption and increased faith in the love of God and His might.

A systems intelligent sermon is a system that is intelligent in fulfilling the chief purposes of a sermon, and these should also include effects in people's lives outside the sermon-situation. Thus, a systems intelligent sermon revitalizes people's caring for their neighbours, encouraging them to extend the love of Christ to all people as His teaching indicate.

The Three Systemic Questions

Hämäläinen and Saarinen present in their article "Systems Intelligent Leadership" (2007) what they call "three systemic questions". These questions are intended to reveal the most essential features of a system. The questions are:

1. What does the system generate – and to what extent is this what we want?

2. How does the system mould us as human beings?

3. What kind of in-between does the system endorse?

Hämäläinen and Saarinen describe the "in-between" in the following way:

> We treat the concept of the "In-Between" (and the "In-Between of people") as a primitive that points beyond the subject-object discourse, seeks not to objectify the space it names, and calls attention to those features of the human condition that give rise to relatedness, connectivity and interconnectivity, intersubjectivity, reciprocity, loops of interpretation and metainterpretation, and to shared experience. "The In-Between" is felt and experienced rather than is fully cognitively known, and often involves intangible dimensions. (Hämäläinen and Saarinen 2007, p. 15)

Another key phenomenon that Hämäläinen and Saarinen urge us to observe is what they call the *systems of holding back*: "The concept refers to mutually aggregating spirals which lead people to hold back contributions they could make because others hold back contributions they could make." (p. 26)

Next, we approach a sermon through the systemic questions, indicate some examples of systems of holding back, and try to discuss ways forward.

What Does a Sermon Generate?

A sermon can deepen the spiritual life of a participant, but it can also generate boredom, dullness and hypocrisy. Likewise, people attending the service might influence the preacher not to give his best. The set-up can amount to a system of holding back.

Let us take as an example a sermon where the content itself is theologically correct but the way it is presented only relates to the rational dimension of the human mind, and lacks appropriate attention to the people attending the sermon and is flat in emotional content. The pastor might, for example, use the daily texts merely as a source for reformulating dogmatic statements without a personal involvement. This kind of a sermon will leave much of the congregation cold. People will not feel uplifted. They respond with dead eyes and growing lack of interest. Because of the lack of positive feedback from his parishioners, the pastor is frustrated. He feels he is dealing with particularly stone-hearted parishioners, and reacts on his part by becoming more content-oriented and emotionally flat than before. He ends up holding back what might be his best sermon because he feels the parish does not deserve it. The parish reacts by sliding into spiritual indifference further still further. A vicious circle is formed, a system of holding back has been generated.

How to avoid such a loop? From the point of view of systems intelligence the key point is to make the system work, and take seriously what the sermon generates as a human system. If the existing system generates boredom and

indifference, that should be acknowledged – and as a sign of the fact that the sermon system is not working. It does not matter if the sermon at the same time generates theologically correct statements because that is only *part* of the system in question and only a part of what is generated.

Jerome Bruner argues in his classic "The narrative construction of reality" (1991) and other writings[3] that "we organize our experience and our memory of human happenings mainly in the form of narrative"[4]. In the context of a sermon, it is critical to ask: what kind of stories and narratives does the sermon as a system generate in the minds and lives of the people attending it? In other words, a key aspect of what a sermon generates as a system is provided by the *narratives* it generates.

Part of Bruner's theory is captured by the concept of *narrative accrual*. By this he refers to the fact that the stories told in a culture tend to accumulate as common knowledge or storage of background assumptions, which then form a basis or a network for new stories to evolve from. He calls this feature of a narrative its *canonicity*. Bruner further states that we as people have an ability of *context sensibility* and *negotiability* that enables us to understand a story and sort of fill in the possible gaps between the story's details in order to comprise a meaningful whole against our background knowledge.

This kind of cumulative effect (narrative accrual) combined with the ability to embed narratives into one's own life (context sensitivity and negotiability) is important to acknowledge. A preacher could for example apply these two elements of a narrative of the salvation history according to the Bible, starting from the Fall of Adam and Eve and from the state of humanity after it. Everything else in the Bible can be framed against this plot-turn. When a preacher outlines this side of biblical narratives, he relates his parishioners with the truly large scale: the whole of mankind has fallen, including each individual sitting in the church.

Likewise, and moving a step closer to particular human communities, a reverend could assess the church history from the viewpoint of an accruing narrative. In this case the Bible as a whole could be the initial state of the accumulating variable and some eras or particular events in church history would then be new *breaches*[5] of a narrative sprouting from the current knowledge storage[6]. Good examples of these could be the times when the gospel has particularly forcefully become present in people's deeds or had salience and has transformed individuals' lives and the lives of their neighbors, communities and even societies, or when Christians have shown exceptional courage and endurance in tribulations.

On a more personal level, we can also consider the sermon and the sacraments of the Church as mediators that bring the incarnation-breach as a divine intervention into the life of an individual Christian. The sermon in a congregation's service can

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[3]See for example Bruner (2004) and Bruner (2002, pp. 69–87).

[4]I do not claim that human mind uses any kind of story to organize human experience. Bruner lists in his article ten key features he finds typical of such narrative. Here, three of them are applied and mentioned by name: narrative accrual, canonicity and breach, context sensitivity and negotiability.

[5]Bruner uses this term to denote a particular manifestation of some classical generic plot

[6]The Roman-Catholic and Eastern Orthodox theologians would probably like to use the term Church Tradition to signify this storage

be seen as such a mediator especially when interpreted in the context of the Word of God as *sacramental* Word. This means that the Word has an inherent ability to affect what it says, because Christ is present in his Word. As St. John puts it in his Gospel, Christ is the "Word made flesh" (Jn 1:14)[7]. Thus a pastor could teach his parish so that while listening to a homily, the parish as a collective and its members individually are connected by the sermon to the eternal story where they have an important role that makes a difference. This way they contribute to the narrative accrual by forming their own mutually affecting particular narratives. Through his context sensitivity a preacher can collect the individual particular narratives as an emerging, congregational narrative and combine this with a biblical one in his sermon. This could be done for example by referring to some concrete situation in life in which some parishioner could be at the moment. To come up with the relevant kind of narratives, a preacher should be sensitive enough to the particular people present; he needs to open himself to the views of others using for instance the five techniques mentioned by Hämäläinen and Saarinen (2004, p. 12); he needs to get to know his congregation[8]. This way perhaps his sermons could be like the stories of great leaders that "wrestle with those that are already operative in the mind of an audience", as Howard Gardner states (Gardner 1997, p. xv).

Through a homily that uses narrative features[9], parishioners can combine the basic articles of faith learned in the catechesis teaching with real life[10]. Here the central idea of making use of the three features of narratives was the following: narrative accrual together with canonicity and breach was applied first to salvation history of the Bible, then to the history of the Church. Through context sensitivity and negotiability the pastor relates to the life narratives of his parishioners and through this feature combined with the sermon and the sacraments the parishioners relate to the narratives of the Bible and the church. Here the sermon as a system

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[7]More about Martin Luther's view on Word with sacramental feature, see Cary (2005)

[8]An interesting approach on communication as *withness*-understanding is presented by John Shotter (2006). Shotter thinks that human communication processes are not simply Cartesian "arrangements or configurations of otherwise independently existing separate parts". Instead, they are "indivisible, unitary, self-structurizing wholes". If this is true, an approach to produce a homily that tries to be as general as possible is doomed to fail since human communication is understood best in a specific, particular context. He further describes this *withness-understanding* in a somewhat lively manner: "In the interplay of living movements intertwining with each other, new possibilities of relation are engendered, new interconnections are made, new 'shapes' of experience can emerge – third 'shapes', third forms of life, conceived when two or more forms of 'flesh' rub up against each other." If a sermon is a success, a mutually nourishing manifestation of this interplay has occurred; the reverend has sensed deep, reciprocal concentration due to his words having resonated with the experiences of his parish.

[9]What is interesting, it seems that a narrative is not only an antonym of rationality, but can be used to bring the dogma alive in a fresh and lively way. Maarten Wisse describes the power of a narrative when teaching dogma: "narrative claims may well be equally or more powerful than the claims of an abstract dogmatic formula. A narrative may combine the strength of a real life picture with the power of rhetoric; thus one is moved by the story almost without having the ability to decide whether one agrees with the message or not. This cannot, of course, be taken to count against narrative. On the contrary, it must count in favour of it." (Wisse 2005).

[10]A kind of mixture of latent and direct learning is discussed in the article of Dane and Pratt (2007). They claim that the use of intuition is especially effective in judgemental issues, such as moral situations. According to them, the ability to use intuition is increased through explicit and implicit learning.

helps the Christians establish themselves as a spiritual community to whom God is performing his saving actions. The aim of the narrative is to convince the people listening to the sermon of the proposal that they are among those for whom Christ incarnated, lived, died and was resurrected.

What Kind of In-Between Does a Sermon Endorse?

Consider a situation where the congregation of maybe 20–40 people sits still in a church with the capacity to seat 500 people. The pastor preaches with monotonous voice, looking like he has left his otherwise buoyant personality in the sacristy. Hymns sound like melodic whisperings and it seems that everyone attempts to sing very quietly so that people behind them would not hear who is out of tune. Only a few people greeted each other before the worship and the congregation disappears to their homes quickly after the organs of the last song have quieted. And this repeats week after week, year after year.

How to turn the direction of a congregation that has drifted into languour? The pastor is clearly in the key position here. Surely one of the potential forces at his disposal is his sermon.

It is clear that besides inspiring deepened faith – and *because* of inspiring it – a sermon should generate a particular kind of "in-between" among the people in the congregation and between the pastor and his parish, as well as in the relation of the parishioner and God. A key point of a systems intelligent sermon concerns the nature of the in-between the system generates as a system. It is important to observe that this question concerns a dimension of the sermon which is not reducible to the content of what is spoken. The emphasis is not on what is spoken as theological statements. The focus is on what kind of an in-between is being created by the sermon as a system.

In order to illustrate some of the possibilities of a systems intelligent sermon, let us first open up the in-between of the pastor and his congregation from the theological viewpoint of *bridal mysticism*. The relevant biblical basis is in the writings of the Old Testament prophets who describe God as a husband and the people of Israel as the wife[11]. This image is later elucidated in Jesus' talk of himself as the bridegroom (Mt 9:15, Mk 2:19). The image is elaborated by Apostle Paul (Eph 5:25) and it reaches its eschatological culmination in the Revelation:

> And I John saw the holy city, new Jerusalem, coming down from God out of heaven, prepared as a bride adorned for her husband. (Rev. 21:2)

According to many Christian churches a pastor is a representative of Christ and speaks as in the position of Christ and for him[12], thus bringing the Logos, the incarnate Word, present through his sermon. Therefore it is not far fetched that a pastor actually has an obligation and a permission to treat his congregation

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[11]For example, see Isa 49:18, 61:10 and Jer 2:32.

[12]The view is based on for example Isa 55:11, 2 Cor 5:20 and further developed by for instance Ignatius of Antioch (IgnMagn 6:1) and adopted also by the Lutheran Church (Ap XIII).

with the same kind of care that Christ treated people during his times on earth. If we keep in mind the dimension of the sacramental nature of the Word, we can conceptualize a sermon as a system which involves Christ in an in-between with his Bride. The tremendous challenge and possibility for the preacher is to facilitate such a system, and the in-between that it involves.

Bridal mysticism is one image the Bible gives to the dialectics of Christ and the Church. When time passes and this image of a pastor and a congregation representing Christ and his Bride is inscribed on people's memories, even a short reminder of it in the beginning of a sermon can create an atmosphere of positive anticipation, when a soon-to-be-married couple waits for the wedding with great excitement: something truly significant is about to emerge.

These observations highlight the exceptional and delicate nature of the "in-between" of a systems intelligent sermon. Surely a lot of sensibility is called for, of the kind Hämäläinen and Saarinen emphasize as a cornerstone of systems intelligent behaviours, from a preacher! Mere command of the content is not going to be enough!

Consider another possibility from secular arts. Esa Saarinen writes about his lecturing methods in his article "Philosophy for managers" (2008): "My own practice is strongly focused on making philosophical reflection contextual and thus embedded in the manager's life. My philosophical approach for managers is essentially a re-contextualization of philosophical practice in the realities of the manager." Saarinen and Sebastian Slotte (2003) articulate the purpose of such lecturing as "the enhancement of real-time reflection on their own lives by the people in the audience". The goal of the lecture is thus focused on "triggering thinking rather than on advice or ready solutions".

The key ideas here include those of re-contextualization and personal reflection. As Saarinen makes philosophical ideas practical, personal and contextual, pastors could do the same to Christian doctrines. My point is to emphasize that this involves re-conceptualizing the sermon as a system as a whole that involves elements not reducible to the theological content of the sermon.

In addition to the image of Bride and Groom, also the expression "brothers and sisters in Christ" of a congregation explicitly refers to a particular form of the "in-between". A dedicated pastor is in a strong position to generate further openings for his systems intelligent behaviour. He might for instance apply the insights from Deborah Tannen's analysis of a family being a "pressure cooker in which relationships roil" (Tannen 2003).

A further perspective for the in-between of a systems intelligent sermon is provided by a key idea of Christian ethics.

In Christian ethics, the figure of Jesus Christ is set as the example, whose 'intentional state entailment'[13] should become a part of every Christian's identity and which manifests itself as 'social objects'[14] that reach their concrete form through the *parenesis* teaching of the New Testament. This does not mean that Christians should imitate some specific acts of Christ but rather an attitude or angle to life, one that is based on love and care for others. Because the parishioners

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[13]See Bruner (1991, p. 7).
[14]See Stacey (2005).

participate in Christ through faith and baptism, their acts should become initiated more and more by the "new creation"[15] (2 Cor 5:17, Eph 4:24). Only after that come the actual ethical norms and commandments. Naturally, these norms are not considered insignificant, but could be compared rather to the fruits of a tree: they are important but not independent and therefore need to be filled by the nutritional fluids flowing from the trunk. Fruit, in this instance, is representative of the ethical norms becoming a living practice through deeds. Fluids stand for the "new creation" giving the motivation to follow the norms voluntarily.

How Does a Sermon Mould Us as Human Beings?

Consider one of the key notions of Christian thinking – *sin*.

Some Christian thinkers, for example C. S. Lewis, state that an important aspect of sin is isolation, the distancing from other people and God (Vaus 2004, pp. 198–199). Luther also describes our nature that is tormented by the original sin – old self – so that it is "curved in upon itself" (Luther 2006, pp. 159–160) and according to some translations, one meaning of "Koine" Greek word for the devil, makes a suggestion in the same direction, namely "dia-bolos" literally means "one who throws apart"[16].

In a parish where this kind of community-related sin prevails, people might think that staying separate is an acceptable way of living congregational life. The situation, like any status quo, might also strike people as unchangeable. Should that be the case, the dictum "Structure generates behaviors" (Hämäläinen and Saarinen 2007, p. 13) would come across in a sad and life-diminishing way. However, a sermon can offer medicine[17] for this highly contagious disease. In Lutheran theology the dichotomy of Law and Gospel is essential, "a special brilliant light", as the Confession states (FC V). The Word of God is considered to have two roles, where the function of Law is to confront us with our sinful nature so that we wake up to understand our dreadful state[18]. The purpose of the Law and this confrontation is to prepare a way for the Gospel. Through preaching the forgiveness of sins the Gospel can become true for an individual and Christ can offer his cure to the wounds caused by sin. St. Paul uses strong vocabulary in describing this process saying the "old self" is "crucified with Him" and we are "united with Him in his resurrection" (Rom 6:1–14).

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[15]However, the actual deeds of this kind of ethics are naturally in accordance with the written ethical norms, such as the Decalogue and the Golden rule. The Lutheran scholars strongly stress that the "old self" does not cease to exist. For further details on Christian ethics, see Rom 7:17–23, CA XII, Apology XX. For a recent discussion, see Eyer (2000).

[16]The source of the translation for the words "dia" and "ballo" is www.zhubert.com [2008-06-01]

[17]Interestingly according to St. Augustine the sin, despite having a personal origin, is a sort of *illness* (Augustine 1887). On the other hand, he presents Christ as a doctor, *Christus Medicus* who cures the illness.

[18]The Law here works in a similar manner as theory in Martha Nussbaum's article (2007). Nussbaum states that when assess our ethics, theory produces *estrangement* or *defamiliarization* due to using unfamiliar language of the theory. In our case this happens by perceiving our lives from the point of view of God's Law.

How is this cure received? The Bible is rich in referring to *communion* with God and with the fellow members of congregation. In St. Paul's letters, the idea of *participating in Christ through means of Grace* is very much present. Notice the relationship-intensive metaphors here! Likewise, baptism is joining into Christ[19] and the Holy Communion is receiving the body of Christ[20] while the members receiving it *are* part of the body of Christ[21], which is the Church. In a systems intelligent sermon with connectivity strongly present as part of the very core of systems intelligence, the preacher as the leader or facilitator of the emergence of the system could and should build on such connection-oriented aspects of the Christian doctrine, and adjust his actions to that overall scheme accordingly. As a result[22] of the *unio cum Christo* the love of Christ starts to influence people's minds and actions creating the kind of in-between described above. The congregation can be a place where the parishioners can flourish and create positive spirals of spiritual uplift and of hope. The fruits of the Spirit flourish: "love, joy, peace, longsuffering, gentleness, goodness, faith, meekness, temperance" (Gal 5:22).

The preacher could also have in mind the explanation of Martin Luther's *Small Catechism* on the eighth commandment (Luther 1921) where he stresses that the parish should exercise an atmosphere of mutual respect.

> We should fear and love God that we may not deceitfully belie, betray, slander, or defame our neighbor, but defend him, [think and] speak well of him, and put the best construction on everything.

Conclusion

The idea of a systems intelligent sermon is to approach sermons as a rich system of potentially huge spiritual impact. In this chapter, I have discussed some ideas as to what is particularly important to acknowledge if the sermon is conceptualized from this angle. My emphasis has been on the positive options opened by the special nature of the sermon, particularly in the dimension of the "in-between".

The chapter is an attempt to indicate how some of the key concepts of systems intelligence can illuminate a sermon in the service of a theologically relevant spiritual uplift.

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[19]Rom 6:3, Gal 3:27.

[20]Mt 26:26, Mk 14:22, Lk 22:19, Jn 6:51, 1 Cor 11:24.

[21]1 Cor 12:12-31, Rom 12:5, Ef. 1:23, Col 1:18.

[22]We will not go here into the debate about the causes and effects in the justification. If interested in a more detailed discussion, see Braaten and Jenson (1998). However, we focus here on the practical observation that the increased desire to carry out the deeds considered as fruits of the Spirit, chronologically usually follows the proclamation of the Word.

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Abbreviations

CA	Augsburg Confession
Ap	Apology of the Augsburg Confession
FC	Formula of Concord
IgnMagn	Ignatius of Antioch: Letter to the Magnesians

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CHAPTER 7

Systems Intelligence and Our Daily Bread

Laila Seppä

> From time immemorial, the human race has explored the world in search of food. Hunger has been the force behind its onward march. Hunger is still the source of mankind's energies, good or bad, the reason for its advance, the origin of its conflicts, the justification of its conscience and the currency of its labours.
>
> Toussaint-Samat (1987, p. 3)

In this chapter the systems intelligent features and other aspects of our daily bread are discussed, highlighting the way in which sensory properties are important in selecting food for consumption. However, the sensory evaluation process is only part of the whole system of food consumption. In systems intelligence we believe that every detail counts on the whole and every part of the system interact with each other and the system. Moreover, the food system is changing all the time. As food is being consumed, the interactions of food components with the human body and emotions as well as with social and eating contexts determine the ultimate perception and liking of that particular food.

Introduction

FOOD IS ONE of the basic elements of our daily life.[1] If we are in good health and not fasting, eating is what we do several times every day. Food is present in our daily and weekly routines. Many name cooking as one of their primary hobbies and books and television shows about cooking are popular. Wine-and-cheese-tasting evenings are successes, too. Despite all that, most of us pay little attention to eating. Or more precisely, to the dimensions of eating. Is food just food, or is there something more to it?

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[1]In this chapter, the word "food" includes, besides the actual food, also beverages as well as raw ingredients and meals, unless otherwise stated.

Food can be defined as a material consisting essentially of protein, carbohydrate and fat used in the body of an organism to sustain growth, repair, vital processes and to furnish energy[2]. However, food is much more than the sum of its energy and nutrients. There are a considerable number of features and nuances in and around food that cause us to select a particular food for consumption. Belitz et al. (2004, p. ix) describe: "Foods are materials which, in their naturally occurring, processed or cooked forms, are consumed by humans as nourishment and for enjoyment. The terms nourishment and enjoyment

Foods are materials which, in their naturally occuring, processed or cooked forms, are consumed by humans as nourishment and for enjoyment.

introduce two important properties of foods: the nutritional value and the hedonic value." Furthermore, there is also the social aspect of food. A dinner made from the simplest of ingredients but eaten with the best and dearest friends tastes like a feast. On the other hand, a banquet among enemies has practically no taste at all or the taste of saw-dust at best. And every time food is little different: Each apple and fish has its own shape and colour. There are thousands, probably even millions of flavour and odour components to be found in food, many of them still undiscovered. And yet, hunger is the ultimate driving force behind food acceptance.

The concept of systems intelligence can be understood as intelligent behaviour in the context of complex systems involving interaction and feedback (Hämäläinen and Saarinen 2007). A system is characterized by the interconnections of its elements, such as emotional, physical and social features, as well as the internal nature of these elements. A food system has at least two kinds of systems intelligent characteristics. Food is collected, prepared and eaten in a system, which consist of various psychological, symbolic and social behaviours. The system is changing all the time, and as the food is being consumed, thoughts, emotions and sensations within the system generate more thoughts, emotions, and sensations. Thus interactions of food components with human biology and social and eating contexts all determine what we like and what we eat.

Our physical bodies also act systems intelligently. That is not always so apparent, because there is so much abuse of our body by food, alcohol, medications and other substances. In situations of change, uncertainty or crisis, these systems intelligent characteristics become visible. As a new situation is evolving, people change their behaviour and adjust to the new system instinctively (Hämäläinen and Saarinen 2007). In addition to this, their physical bodies adjust to the new situation, too.

Writing a chapter on food is a serious challenge. Everybody knows something about food, but to say anything precise is demanding, as food system keeps changing. It is perhaps one of the most complex systems which exists. A complete chemical analysis (which is impossible because there is always more to study) does not tell much about the acceptability of a food. And even if the taste was delicious, it counts for nothing if the situation is not right. Practically everything

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[2]http://www.britannica.com/eb/article-9034792/food [2008-03-31].

about food is relative, situation specific and full of paradoxes. However, systems intelligence is an excellent tool to handle paradoxes (Hämäläinen and Saarinen 2007; Kauremaa 2007).

Sterman (2002) describes how he has it difficult to define what systems dynamics is as it is so many things, and so much more. The same applies to a food system. It deals with chemistry, physics, engineering, ethics, ethnology, psychology, biology and history, to mention only a few disciplines. Thus the availability of food, food types, and food choices interacts with a wide range of socio-economic factors (Gesch 2005). Sterman (2002, p. 506) describes: "One of the main challenges in teaching systems dynamics is helping people to see themselves as part of a larger system, one which their actions feed back to shape the world in ways large and small, desired and undesired." This is what I try to do, too.

Food Acceptance

Actually, what is food? Well, it is something that we eat to get our bellies full and thirst quenched. It consists of biological components such as proteins, fats, carbohydrates and vitamins and some inorganic components and minerals, the most common of them being sodium chloride, table salt. However, even green grass contain some of these components but very seldom do we eat them on purpose. To be able to eat a particular food you have to be able to do that, that is, you have to accept that food as edible and suitable for you. This phenomenon is called *food acceptance*. It is determined by several (bio)chemical, physiological, personal, dietary as well as psychological, ethical and cultural criteria (Cardello 1996; Martins and Pliner 2005). Bergier (1987) divides culture related reasons for food acceptance into four categories:

Material factors. These include the abundance or scarcity of food globally or locally, seasonal availability, diversity of resources such as spices, sweeteners and other ingredients. Commercial, economical and political reasons fall into this category.

Social factors. Different groups of a society can have different eating habits for budgetary or availability reasons. In a hyper market there are much more alternatives than in a small village shop. On the other hand a busy city-single might not have many opportunities nor time to choose his or her meals.

Religious factors. Religious taboos prohibit certain kind of food either permanently or periodically, like during fasting. Religious rules can also demand or promote the consumption of certain foods for hygienic, symbolic or magic reasons.

Additional factors. These are traditions that sometimes originate even from the time immemorial. Anthropologist Levi-Strauss called them mythological reasons.

Systems evolve over time producing complex and often not-so-obvious responses and feedback (Sterman 2000; Hämäläinen and Saarinen 2007). According to Hazy et al. (2007) complexity usually refers to a high degree of systemic interdependence, which leads to non-linearity, emergent processes and other surprising dynamics. Bergier (1987) points out that the cultural background of food acceptance changes and develops alongside changes in political, social, demographical and economical structures of the society and its culture. New customs and norms do not replace older ones but are superimposed and thus enrich and complicate the food environment. GMO, organic foods and fair trade products are modern examples of politically motivated food acceptance, but the old questions like hunger or the price and quality of food have not vanished.

The systems intelligence concept reminds us that there is always an invisible system along with the apparent system (Hämäläinen and Saarinen 2007). Both the visible and invisible systems produce beliefs, which in turn produce behaviour and more beliefs. Many of these beliefs are based on human emotions and mental models, and these cause more effects on the system. Bergier (1987) mentions that horse meat was not banned by the medieval church. However, disgust towards horse meat in many cultures probably has its origin in mythology. Horse was a sacred animal for Romans and consecrated to Neptune. Besides, many people have horse riding as a hobby and feel that a horse is more like a pet than a domestic animal.

The cultural background of food acceptance changes and develops alongside with changes in political, social, demographical and economical structures of the society and its culture.

Traditions have a powerful influence on what we prefer, what we like and what we eat. Globally people often eat what is available and cheap enough although they might not prefer it. Thus it would be a mistake to think that the most widely consumed foods are the most widely liked (Cardello 1996)[3]. The concept of *liking* refers to the immediate qualitative, *hedonic* evaluation of food, and the degree of experienced pleasure or displeasure. *Preference* is often used as a synonym for liking, but actually preference is better used to express choice (Mela 2001). A product may be preferred over another for reasons such as healthiness or price, even though it is not liked.

The social dimension of eating is of great importance. Gesch (2005) points out that food is a meeting point of the social and physical worlds. Most of traditional family routines are based around meals. Hämäläinen and Saarinen (2007, p. 14) note that "people influence one another far beyond what is the visible." In this process food creates connectivity over time and space. There are many traditional foods that are related to special events like weddings or birthday parties or celebrating Christmas or New Year (Cayot 2007). These occasions include gathering of relatives and friends enjoying each other's company and the many different dishes and delicacies. Consequently environmental cues, including but not limited to food itself, have an important role as a stimulus to eat. As Mela

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[3]Actually, this applies to any article, such as clothes, shoes, cars or housing.
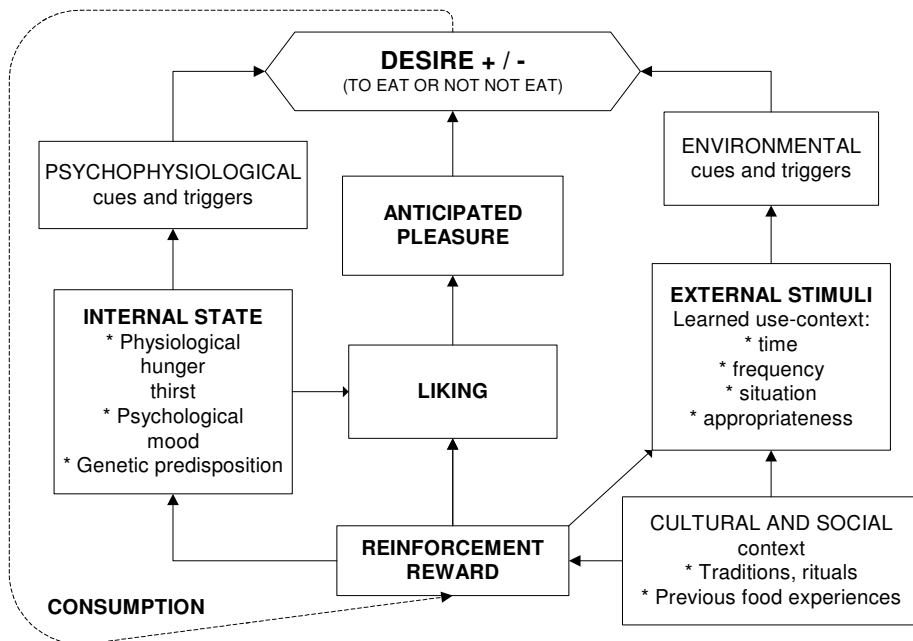
Figure 7.1: Flowchart describing the system of combined influences of internal state, external stimuli, liking and feedback from consumption in the desire for foods. Adapted and further developed from Mela (2001) and Mela (2006).

(2001) notes, we may like fish soup and wine, but have no desire to have them at breakfast. Thus desire can be strongly influenced by feelings of appropriateness. In order to understand why certain food stimuli are liked or desired, it is vital to study not only the immediate oro-sensory responses but also the system on wider perspective (Mela 2006). At any given moment a conscious feeling of the desire to eat a particular food is the outcome of several factors, illustrated in Figure 7.1.

Learning and Neophobia

Sterman (2000) states that all learning depends on feedback. This is true with food also, as learning plays an enormous role in food acceptance. When a person gets nauseous after eating certain food, it becomes disliked (Cardello 1996). This disliking, or rather disgust, can last a lifetime. And when it comes to eating habits, humans are often quite conservative. They are reluctant to consume unfamiliar foods, which is called neophobia (Logue 1991; Martins and Pliner 2005; Martins and Pliner 2006). This phenomenon is usually explained that it prevented our ancestors from ingesting potentially toxic or lethal substances. Food neophobia is shown to be stronger towards unknown food of animal origin than towards unknown food of nonanimal origin. This is confusing, because there are numerous toxic berries and other plant parts out there in Nature, while most of the animals

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are edible. However, food of animal origin will usually be spoilt more rapidly than food of nonanimal origin. Spoilt meat and fish are toxic because of microbial contamination and can be extremely dangerous, whereas a plant once found to be safe usually stays safe[4]. Thus what at first glance seems to be contradicting turns out to be an excellent example of systems intelligent behaviour of our ancestors.

In modern societies where there are many safeguards against dangerous foods entering the food supply, food neophobia is not very useful anymore. On the contrary, it can be harmful and maladaptive, because it might restrict the number and types of food consumed (Martins and Pliner 2005). Children are usually quite neophobic. This is at least partly learned behaviour. Early exposure to a food can result in increased preference for that food (Logue 1991). Mustonen and Tuorila (2007) have demonstrated that neophobia in children can be reduced by sensory training. Fulton (2006) describes neophobia felicitously in her paper on medieval cookery and sweet taste:

> Now think about why you may have reacted this way, depending of course, on your culinary experience. What seems to have concerned you most? That some of the ingredients were unfamiliar or hard to get ... That some of them were not in your regular diet because you prefer not to consume them for spiritual or moral reasons ... That some of them did not seem to fit with each other ... Did you think at all about the color ... Or were you primarily concerned with doing without the sugar ... [Knowing the origins of the course w]ould you be more or less willing to try a taste? Why or why not?

Not only unfamiliar foods but also new technologies can cause anxiety, which is only partly based on scientific facts. Especially perceived safety is important in selecting food. Things and ideas that are unfamiliar cause suspicion and uncertainty (Logue 1991; Cardello 1996; Bäckström et al. 2003). Furthermore, food is considered personal, even an intimate issue and important to one's identity, like the old saying "we are what we eat" tells us. Tuorila (2001) divides new foods into five categories: Functional foods with beneficial health effects, genetically modified foods, nutritionally modified foods, organic foods and ethnic foods. Bäckström et al. (2003) demonstrate that organic and ethnic foods seem to be more trusted and are found safer and more pleasurable than new biotechnological foods. The underlying reason might be that organic and ethnic foods have already been tested by other people and do not represent real novelties in people's minds.

Food neophobia can affect the overall nutritional quality of an individual's diet. Especially with older people it might happen that when a certain favourite food is no more consumed (either for health or availability reason), nothing comes instead. However, humans exhibit both an interest and reluctance to eat novel foods, thus if the interest side is enhanced, nutritional status might get better. Hämäläinen and Saarinen (2006) introduce the concept of "system of holding back" which describes a situation when something is avoided for one reason or another, and consequently "the avoider's" own possibilities to interact diminish.

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[4]See for instance McLauchlin and Little (2007) on the concepts of food poisoning and hygiene.

Often the reason for avoidance is fear, as also with neophobia. But if the system of holding back is overcome, excitement and desire for more sensations is back, and perhaps new favourite foods and lifestyles are found.

Dienstbier and Zillig (2002) review the concept of toughness. The theory of toughness could perhaps be applied to food liking and learning as well as to culinary and gastronomical enthusiasm. Toughness is about the harmony and interactions between physiological and psychological systems. All the major physiological systems within a human body (or any living organism) interact, so that the state of one system will influence most of the other systems. This corresponds with systems intelligence, where we believe that every detail counts on the whole, and every part of the system interacts with each other and the system (Hämäläinen and Saarinen 2007). Toughness

Things and ideas that are unfamiliar cause suspicion and uncertainty. Especially perceived safety is important in selecting food.

theory emphasises the significance of training effect on systems. Most of us probably know the effect of spicy food. The first time it might taste too hot, but perhaps on the third or fourth time we start to like it. Perhaps we develop a growing interest in other spicy and exotic foods, too. Thus gradually the system of holding back diminishes and uplifting culinary sensations come instead.

Sensory Dimension

There are five basic tastes: salty, sweet, sour, bitter and umami[5]. The main senses used to evaluate food are taste and smell (odour), which together form the concept of *flavour*. Furthermore, visual, textural and auditive cues are important in food selection and evaluation (Cardello 1996). All of them affect our daily digestion and nutrition. First, when we see, smell, or even think about food our digestion system starts working[6]. The secreting saliva participates in the initial breakdown of food by affecting flavour release (which causes more saliva to secrete), diluting flavours and tastes, dispersing and starting the break down of nutrients and lubricating oral tissue (Engelen et al. 2007). All sensory stimuli adapt after a period of stimulation. Most taste compounds exhibit a wide variety of qualitative interaction when mixed with other components. Taste suppression or unexpected taste and smell experiences can occur when two or more flavour components interact (Cardello 1996).

Most sensory stimuli, but especially food, elicit a hedonic, pleasure dimension in addition to the basic dimensions of quality, magnitude and duration of the sensory experience (Cardello 1996). Pleasure is a totally subjective phenomenon and not directly measurable as such. The degree of liking (or disliking) is called

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[5]"Umami is a savoury taste imparted by glutamate and ribonucleotides, including inosinate and guanylate, which occur naturally in many foods including meat, fish, vegetables and dairy products ... Umami plays an important role making food taste delicious." See http://www.umamiinfo.com/what_exactly_is_umami/ [2008-05-13]

[6]Most of us probably remember the Pavlov's dogs from Biology or Psychology classes at school.

hedonic response. It is context specific and can be measured with hedonic ratings, which are self-reports of subjective experiences (Tuorila 1987). Maximal hedonic responses usually correspond to the concentration of active component typical for the product which people have come accustomed to (such as sugar level in juice).

Babies are born with positive hedonic responses to sweetness (e.g. Logue 1991; Mela 2001). As it happens, mother's milk is sweet. How systems intelligent of Nature! Newborn babies dislike sour and most bitter taste stimuli. Ability to sense salty stimuli develops in a few months. There is contradicting evidence whether there is an inborn, unlearned hedonic response to odours recognised as pleasant or unpleasant by adults. However, newborn babies seem to recognise their mothers by the smell (of milk, most probably), which most mothers and midwifes know from experience.

Our body and physiology are amazingly built so that basically our body will tell what is good for us – if we are willing and able to listen to it. In any given moment, a factor called homeostasis tries to maintain a physiological balance in the body (e.g. a feeling of thirst is experienced after high salt intake or sweating in sports). On the other hand, homeostasis is not the only driving force in our eating habits. Earlier we discussed toughness theory and learning (Dienstbier and Zillig 2002). For example, certain kind of learning can lead to specific neuro-endocrine system modifications which in turn lead to specific impacts on personality, performance and health. Continuous under- or overeating will eventually lead to changes in psychology and physiology.[7] Unbalanced eating is associated with numerous diseases, but the interactions with eating, homeostasis, sensory experiences, health and diseases are extremely complicated and beyond the scope of this chapter.

Psychology and Food Acceptance

The development and maintenance of food acceptance is controlled by a myriad of affective, personal, cultural and situational factors. When individuals are asked to indicate why they choose the foods they do, *sensory* and *pleasure* factors (particularly taste) and healthiness are the motives most often cited (Martins and Pliner 2005; Martins and Pliner 2006). Foods are rejected if they are known or believed to possess negative sensory properties (bad taste, smell etc., commonly referred as *distaste*) or if they are believed or known to promote harmful consequences, in either short- or long-term (rejection based on *danger*). These danger-reasons include fear of allergic reactions, avoidance of junk food and demand for organic or otherwise special food. Avoidance based on danger can become in excess, in hypochondriac proportions.

On the other hand, some culinary traditions have severe risks, the most famous is probably a dish called fugu[8], which if not properly prepared is deadly poisonous. The same applies to some mushrooms like false morel[9]. Also some common practices of preparing food are harmful. Barbecuing a steak causes multiple carcinogenic and teratogenic components to emerge on the surface of

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[7]See for instance Gesch (2005) and Schlosser and Wilson (2006) for further references.
[8]Made of tropical puffer fish or blow fish (*Tetraodontidae*).
[9]*Gyromitra esculenta*.

the meat (Belitz et al. 2004). The more taste, the more of these components, unfortunately. However, most of us do not give up barbecuing, the danger seems too distant. Also excess salt, sugar or fat in food is harmful and reduction of those components in most western diets would improve the nutritional and health status of the population. Cayot (2007) reminds us that eating with pleasure leads to satiety more rapidly and may be important for the well-being and health of the population.

Forces – both intrinsic and external – acting against the change in food intake are often powerful enough to obstruct the impact of health education (Tuorila 1987; Cardello 1996; Schlosser and Wilson 2006). Basically, people resist too strong and pushy nutritional guidance, because eating is considered a very personal matter. Food has also ability to evoke intense hedonic reactions as a reward and give motivation to eat more. Some of the food marketing practices are quite foxy and crooked, for example giving promises of instantaneous weight loss or more friends and better looks. Cardello (1995) points out that although nutritional quality is important in food acceptance, the perception of nutritional value is critical. Similarly perceived safety is more important than real safety.

Here we notice that mental models are major criteria in food acceptance. To succeed, health education should dig into the mental models that dominate the selection of foods and lifestyles. People often adjust to what they *believe* is the system and their actions reflect the assumed nature of that system (Hämäläinen and Saarinen 2006). The systems intelligent approach could be a useful tool in working on their mental models, as it wants to take an insider's view of the system. This might express itself in something as simple as a few words uttered in the proper place and time, and suddenly the real meaning of what the health educator is saying would break through.

People often adjust to what they believe is the system and their actions reflect the assumed nature of that system.

However, to find the right words necessitates looking into the world of the person receiving the information; *looking beyond the obvious.* Gesch (2005) tells about a project dealing with prisoners. It was found out that most of the inmates did not know what vitamins are, let alone knew which foods contained them. So how would it have been possible for them to eat healthy (before entering the facility)? Even ordinary people often fail to understand some details of nutrition. An acquaintance of mine who was little overweight did not understand why his wife kept urging him to eat more vegetables and to stop eating greasy sausages – until one day he realised that it was all about the energy *content*. Creative holism, discussed by Jackson (2006) emphasises the importance of managing problem situation from a variety of points of view and using different systems approaches in combination.

The knowledge or assumption of the nature or origin of the substance plays a role in food acceptance or rejection. Two types of these reasons can be named: *inappropriateness* and *disgust* (Martins and Pliner 2006). Rejections based on inappropriateness occur for items that are typically not classified as food within a given (or any) culture, such as clothing, paper, houseplants or other items of non-

food origin. Food served at a wrong time or situation is considered inappropriate, too (Mela 2001). Rejection based on disgust occurs because of what a food is or where it comes from or its social history (Martins and Pliner 2006). These foods have offensive properties: they are presumed to taste bad or have the capacity to contaminate other foods. For example, in many cultures there is a strong taboo against eating animals that have died of unknown reasons and the blood has not been drained (Bergier 1987)[10]. This has major health benefits as the animal might have died because of a zoonosis[11], and undrained meat also spoils easily.

Rozin et al. (1996) point out that rejection based on the idea of what the food is or its origin is, is probably the strongest emotional response people have to foods. Most cultures have at least some decayed dishes that other cultures find disgusting. Kurlansky (2002) mentions that Romans had dishes made of putrefied fish and offals, which most modern-day western cultures find appalling. Disgust serves also as a major component of moralization (Rozin et al. 1996). Vegetarism based on moral values is more likely to find meat disgusting than when vegetarism is chosen for health reasons. Disgust influences availability by eliminating certain products from the domain of choice.

Rejection based on the idea of what the food is or its origin is, is probably the strongest emotional response people have to foods.

However, in situations of great need, like severe famine or other imminent devastation, humans have the ability to overcome the barriers of distaste, danger, disgust and inappropriateness. During famine people have eaten materials like grass, leaves, soil, leather reins, rotten vegetables, rats and carcasses. Charlie Chaplin eating shoe soles in The Gold Rush has been (and unfortunately, still is) the reality for some. North European people have eaten bark from pine trees. Dutch people ate tulip bulbs to survive during WW II. In some cases, even cannibalism[12] has been reported when facing severe hunger (Reid 1974). These details are horrendous, but show how people have a strong will to survive. In order to survive they can overcome taboos and restrictions. Moreover, the body of a starving human being acts systems intelligently by going to a state of low consumption. There are real physical changes as all excess resources in the body itself, like most of the fat and muscle proteins, are used by that same body for survival[13].

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[10]3. Mos 22:8 "That which dieth of itself, or is torn of beasts, he shall not eat, to defile himself therewith" and 5. Mos 14:21 "You shall not eat of anything that dies of itself: you may give it to the foreigner living among you who is within your gates, that he may eat it; or you may sell it to a foreigner".

[11]Zoonosis is an infectious disease that can be transmitted from animals to humans (and from humans to animals). See e.g. McLauchlin and Little (2007) and http://en.wikipedia.org/wiki/Zoonosis [2008-03-31].

[12]This is not to be confused with Cannibalistic tribes, which had cannibalism as accepted behaviour in their culture.

[13]For example fats and proteins stored in body's adipose (fat) and muscle tissues are used to provide energy for the heart and the brain, see e.g. http://www.britannica.com/eb/topic-563746/starvation and http://en.wikipedia.org/wiki/Starvation [2008-3-31].

Quality of Food

The quality of food has more sides than meets the eye at the first glance. Historically, there have been more problems with the quantity than with the quality of food, although the overall quality has not been very good either. In ancient times the diets of common people were monotonous and unbalanced most of the time. As Bergier (1987) describes, the bread was hard and rough, there was very little choice in vegetables and the meat was tough and had gamy flavour[14]. Crusades resulted in the introduction of spices and new dishes, as did the great exploration voyages some centuries later. Also the invention of better kitchen stoves improved the quality of food. Thus the situation became gradually better. However, we should beware of regarding our ancestors as primitive. Already in the ancient times there were regulations regarding the state of meat and other foodstuffs on sale (Toussaint-Samat 1987; Fulton 2006). Toussaint-Samat (1987, p. 539) reminds us that there were more bath-houses in medieval Paris than public baths in the 19th century or even in the beginning of the 20th! There is also evidence that the content of some nutrients in grain and vegetables used to be higher before the time of modern industrialised agriculture (see e.g. Gesch 2005). Our ancestors did not eat highly processed food either (e.g. white raffinated flour or soft drinks).

Quality is a relative concept and should not be examined in isolation. Especially with biological material everything affects everything. Food quality goes hand in hand with food acceptance and liking. As Cardello (1995) says: "It is relative not only to who is doing the evaluation, but to a wide range of situational and contextual factors." Cardello quotes H. Clarke, who said in 1870[15]: "... food quality is a relative concept that is inappropriate for evaluation by anyone other than the average consumer of that food." Mr Clarke also noted a basic truth: the quality of a food product depends on the circumstances of the place and situation where it is consumed. A portion of canned meat is well suited on a sea voyage, but would be inappropriate at a fine meal in a first class restaurant. Said Mr Clarke: "Those to whom an article is truly acceptable are those who cannot get anything at all so good."

The quality of a food product depends on the circumstances of the place and situation where it is consumed.

Cardello (1996) divides food quality based on food acceptance behaviour into four measurement levels: Physical, sensory, perceptual and hedonic levels. Physical level consists of the physical and chemical structure of food. Sensory, perceptual and hedonic levels are intertwined. Sensory level consists of basic sensations and hedonic level tells how much (and how) that food is liked. Perceptual level consists of flavour, texture and appearance profiles such as how the food looks, smells and tastes. Texture is a multifaceted feature and can be examined by hand (touching or breaking), eyes, ears and mouth. Chewing the food might give specific

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[14]Flavour and toughness in meat is the result of animal breed, nutrition and butchering practices. Sloppy butchering and poor handling of meat may cause unpleasant off-flavours and toughness. Both ante and post mortem conditions affect the overall quality of meat; see for instance Lawrie and Ledward (2006).

[15]In volume 1 of The Food Journal, 1870.
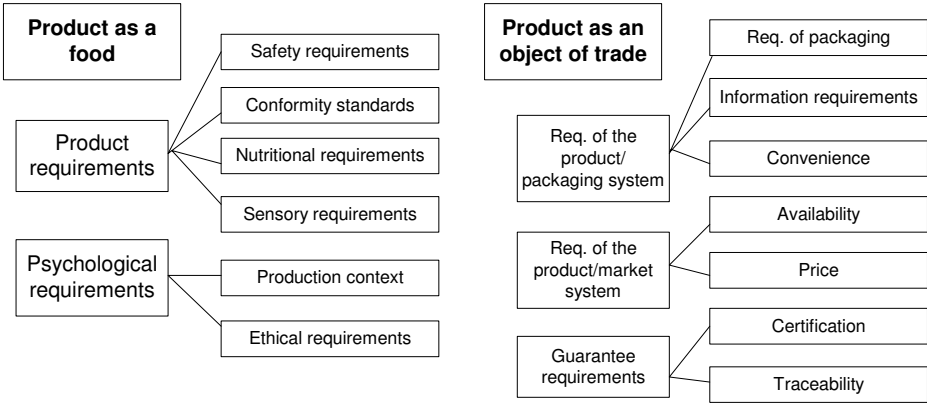
Figure 7.2: Food quality as product requirements, adapted from Peri (2006).

crispy and crunchy sounds. Mouthfeel can be for example slimy, creamy or grainy. There has been a lot of effort to develop instrumental sensors to monitor sensory properties. Notwithstanding, human sensors are still today the most common instrument for food evaluation. The use of instrumental analysis is limited by the fact that usually they are based on a single dimension, while sensory properties are multidimensional parameters (Cayot 2007).

Peri (2006) introduces "The universe of food quality" model to describe the quality system of food, especially from the consumer point of view. It is a system of product requirements both material and immaterial. Dynamics of the quality system is a complex and many-sided relationship between processing conditions, product characteristics and consumer requirements.

Figure 7.2 presents this quality system as product requirements, which are related to the product itself, the production context and both the packaging and market systems. A serious failure to meet any of these 13 requirements can lead to the rejection of the product even if 12 properties are fully satisfied. On the other hand, deficiency in one requirement may be compensated by abundance of another. For example nutritional benefits may make a poor sensory quality acceptable. Even safety can be replaced.

It is obvious that many of these requirements apply to almost any form of business as not many fields of trade or business can act in a vacuum. All parts of the economy interact with each other, either directly or indirectly. For example, traceability of fabrics, shoes and garments is gaining more importance as a part of the campaign against child labour, just like traceability of meat is important in fighting animal diseases and in monitoring animal welfare. In complex systems like overall quality, systems intelligence might offer a new possibility to value all these requirements, as many of them are not comparable with each other as such. Through systems analysis, requirements can be given price-tags and further evaluated.

As stated above, consumers' opinion should be an important criterion for food quality. Although consumers' attitudes were briefly discussed in the 19th century,

the idea of sensory evaluation done by these same consumers was forgotten for over 100 years (Cardello 1995). Most sensory evaluation was thus done by experts, and still is especially in the coffee, tea, spice and wine industries. In these fields expertise is needed to distinguish nuances and set the correct price for each quality class. These classifications do not tell much about the degree of liking by ordinary consumers.

Although a lot of valuable information is gained via sensory evaluation by consumers, there are some pitfalls. When dealing with food, which is biological material and thus more or less prone to be micro-biologically or chemically spoiled, great care should be taken when planning changes in the recipe. For example, changes in sugar, fat or salt levels might cause problems in self-life and consistence of the prod-uct.[16] In addition, interpretation of the results of all behavioural studies (including sensory evaluations)

The interpretation of the results of all behavioural studies must be done in extremely cautious way.

must be done in extremely cautious way. In order to understand why a certain food is liked and gives promise of frequent consumption, a careful consideration of the dynamics of the acquisition process should be conducted. The real meaning of the changes in liking should be evaluated thoroughly (Zandstra et al. 1999; Mela 2006). A classical failure in this field was the attempt to sweeten Coca-Cola, which ended up with an economical and public image disaster (Dubow and Childs 1998). Notwithstanding, from the systems intelligent point of view, even failure has potential for future success, as "systems are the door to a potentially boundless space of possibilities" (Hämäläinen and Saarinen 2007, p. 24).

Mental Models and Food Acceptance

Mental models affect – often unconsciously – the process of selecting, consuming and evaluating food. Hazy et al. (2007), Sterman (2000) and Sterman (2002) have discussed mental models thoroughly in technology and management situations. Many of their ideas can be applied to food acceptance and consumption as well.

Mental models can be described as a collection of routines or scripts for selecting possible action; they are invisible cognitive maps of a domain. Active modelling occurs well before sensory information

Mental models are a collection of routines or scripts for selecting possible action; they are invisible cognitive maps of a domain.

reaches the areas of the brain responsible for conscious thought. Most people believe that their senses reveal the world as it is (Sterman 2000). On the contrary, our sensory and cognitive structures can reveal *only an image* of the real world. Earlier we discussed the disgust against a certain food after nausea. The reason for

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[16]In their review article Ruusunen and Puolanne (2005) have discussed salt and other ingredients in meat products. For example simultaneous reduction of salt and fat might cause both sensory and technological problems that need to be solved.

nausea is often something else than the food eaten just before the attack. It might be gastric infection unrelated to food, or in case of food poisoning, incubation time might be several days[17], and the preceding food is therefore not to be blamed. Notwithstanding these facts, the food preceding sickness may remain for ever disgusting.

We make decisions that alter the real world, and these decisions are based mostly on the image of the world. To act and learn, we must use the limited and imperfect feedback available to understand the effects of our decisions (Sterman 2000). In earlier times, survival often depended on the ability to interpret reality rapidly. To be able to run instead of freezing was crucial when facing a threatening situation. But sometimes it was more dangerous to act than to stand aside, be it a poisonous plant or war expedition led by the king. However, without courageous individuals, no new worlds or ideas or foods would have been discovered.

We experience the real world through filters. The act of measurement brings along delays and errors, some known, some unknown. After all, measurement is an act of selection (Sterman 2000). Sometimes getting feedback is delayed. In a big city a shopkeeper might never know why his regular customer stopped coming; is the customer dead, has he moved or was there a severe disappointment of some kind? Information systems on the feedback can also get better, as for example the internet has aided the collection of feedback from the clients.

Every link in the feedback loops can be weakened or cut by a variety of structures, like physical or institutional features of the environment. These might reduce opportunities for change and prevent us from learning the consequences of our actions. Some are consequences of our culture (Sterman 2000). Rozin et al. (1996) contemplate that if a culture desires that something should be avoided, the best way is to make this something an object of disgust. Disgust is most probably communicated and acquired in social situations (Rozin et al. 1996, p. 101):

> Socialized individuals carry in their heads a set of negative attributes to a range of animal products and decayed foods; along with many non-food disgust elicitors ... Expressions of disgust by others have major influence on an individual's food choices. And the acquisition of disgust, in a social context, is both a major feature of socialization and a major mechanism through which further socialization is accomplished.

Learning to occur, each link in the feedback loops should work effectively, but often they do not (Sterman 2000). Dynamic complexity, imperfect information, poor scientific reasoning skills, defensive routines and other barriers impair the feedback process. Also misperceptions of feedback limit our ability to understand the truth. After all, in most cases, things are not quite what they look like. An illustrative trial of misinterpreting the signals is white wine dyed to look like red wine (Morrot et al. 2001). The wine evaluators gave the wine characteristics of red wine, although they must have sensed the typical nuances of white wine. They relied more on their eyes than on their other senses.

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[17]Incubation time e.g. for *Salmonella* is 5–72 hours, *Campylobacter* 1–10 days, EHEC (dangerous strain of *E.coli*) 1–14 days and Norovirus 12–24 hours (McLauchlin and Little 2007).

Our cognitive maps of the causal structure of systems are vastly simplified compared to the complexity of the systems themselves (Sterman 2000). We are unable to infer correctly the dynamics of all but the simplest causal maps. Most people do not generate sufficient alternative explanations, or consider enough rival hypotheses. According to Sterman (2000), the greater the dynamic complexities of the environment, the worse people perform relative to potential. This seems to be true with food also.

Western people are having more and more opportunities to choose healthy foods, but they seem to make a lot of bad choices.

Western people have more and more opportunities to choose healthy foods, but they seem to make a lot of bad choices. Fulton (2006, pp. 194–195) highlights this dilemma:

> Food, although it may be bland or even 'tasteless', is never experientially neutral . . . We act on it, making it signify things that we want to say about our relationships to each other, and we judge others (not to mention ourselves) on how they respond to its relative absence or presence, for example, by eating 'too much' or 'too little' or, if they choose not to share their food, sometimes even by eating each other.

A Taste of History and Emergence

Food has interesting connections with other systems such as sociology, ecology and even world history. The power of food and food related substances is not to be underestimated as food has started wars, empires have been built and lost, and fortunes have been earned (Toussaint-Samat 1987; Kurlansky 2002, Fulton 2006). Food has been a popular item to tax. Materials like white sugar, tea and coffee have been objects of taxation. Perhaps the most cunning idea was to tax salt. Everyone needs salt. It was needed for preserving food before the age of refrigeration. It is essential for proper baking and cooking, and the human body also needs some salt. For example France was divided into four different salt taxation areas with very different tariffs. This unfairness was, no doubt, one of the reasons (of course, not the only reason) for the French revolution. Also the unfair taxation on tea was the tipping point that exploded the Independence war of the United States of America. Nobody dies without tea, but it is an important part of the daily routines for many.

Invaders or immigrants have brought their dietary customs with them, as if symbolically importing a little soil from their native land (Toussaint-Samat 1987). Many 19th century immigrants of Italian origin were near starvation in their new homeland in the United States (Bergier 1987). They thought that the anglo-saxon-type of food available was horrible and missed their cheeses, salami and olive oil from their homeland. Most of them were too poor to afford them. This era is vividly described in the movie Godfather II. When studying the situation of these immigrants, we find that something extraordinary happened: a food revolution. Indeed, the Italians were quite successful in introducing their food to the United States and later to the whole world. There are not many places

on this earth were pizza and pasta is not available. This is in accordance with systems intelligence: systems can be changed as they are not absolute; however oppressing the original situation might be (Hämäläinen and Saarinen 2007). And yet something more is needed: a touch of emergence.

Hazy et al. (2007) describe emergence as the coming-into-being of novel, higher level structures and processes. Emergence is an outcome of the dynamics generated out of the interactions between the lower level agents that constitute the system. Emergence does not happen by itself, it involves tending and encouragement from its component agents as well as from the higher level. Emergence would be something extraordinary, such as the school food projects[18] now emerging. In England also the Naked

Emergence is the coming-into-being of novel, higher level structures and processes.

Chef Jamie Oliver has joined the campaign for better food at schools (Schloesser and Wilson 2006). It is not insignificant or meaningless that public faces stand for a cause. They set an emergent example to others. In systems intelligence we believe that the system can be changed through individuals. It is about making a difference by setting the system in motion; by creating a resonance in human hearts and wills (Hämäläinen and Saarinen 2005). However, as Hazy et al. (2007) note, emergence cannot be controlled, it happens if it happens, just like pizza and pasta conquered the hearts of people all over the world.

In many traditional kitchens, great care is taken to set the table and courses aesthetically. Visual cues are important in food acceptance and consumption (Cardello 1996). This was realised early in human history. Fortunes were spent on cutleries and services. Roman feasts were famous for luxurious settings and exotic dishes. The kings, noble men, prosperous merchants and wealthy burghers followed this tradition of gluttony through middle ages and later (Bergier 1987). Fulton (2006, pp. 188–189) depicts:

> No reader of medieval cookery books can fail to be amazed by the attention lavished by their authors on the correct presentation of foods. How the food looked was clearly a matter of concern not only for those who would prepare the more elaborate subtleties for the great feasts of the wealthy – ... roasted peacocks and swans served reassembled in their own feathers; ships and castles fashioned out of pastry and marzipan ... – but even for those making only the most humble of pottages.

As Fulton (2006) and Bergier (1987) note, the dishes of ordinary people were modest. While preservation of food was complicated, it was typical to have feasts after harvest or in late November after slaughtering the pigs for winter. Then also the lowest of the population had the chance to celebrate. Astrid Lindgren, the most famous Swedish author of children's books, describes the menu for a country feast in the beginning of the 20th century (1963, pp. 56, 65):

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[18]http://www.foodforlife.org.uk/ [2008-03-31].

> Up under the roof [of the food store] smoked hams and black puddings hung in long rows, a whole line of them, on a pole, for Emil's father was very fond of black pudding with bacon and white sauce. And there in a corner stood the bread chest full of delicious loaves, beside the cutting board, with all the yellow cheeses and crocks full of freshly churned butter. Behind the table was the wooden vat full of salted pork and next to it the big cupboard where Emil's mother had her raspberry juice and pickled cucumber and pear ginger and strawberry jam. But on the middle shelf of the cupboard were her delicious sausages ... There was calves liver and spare ribs of pork and meat balls and soused herring and salmagundi and stews and puddings and jellied eels as much as they could eat. And to end up with they had the most delectable curd cake with raspberry syrup and whipped cream.

The importance of aesthetics in setting and atmosphere is touchingly described by Gordon (1965) in his memoirs on Japanese prison camps in the Far-Eastern jungle. They did not have much, but the little they had they arranged beautifully on Christmas Day. They even conjured up Christmas pudding out of almost nothing. As Hämäläinen and Saarinen (2007, p. 31) note, of all the systems available to humans, the symbolic dimension is the most accessible when reaching out to the emergence of life-enhancing systems. This is verified by Gordon (1965); the beauty of small symbolic gestures changed the remorseless rules of the death camp. Simultaneously as they started taking care of the sick and the dying, their spirits rose. A starving man holding the hand of a dying fellow prisoner gave hope of decency and dignity to all of them. Many of us think we know what hunger is, but we do not! But there, in the camp a really hungry man was able to share his food with somebody else[19]. Consequently enthusiasm in caring for others and sharing the food multiplied, which in turn gave more hope to all of them, although the overall circumstances were getting worse.

The example of a death camp is beyond the grasp of most people. However, even in our everyday life there is a chance for groundbreaking gestures as systems intelligence has emphasis on the human element of the system, particularly in its invisible, symbolic and emotional aspects (Hämäläinen and Saarinen 2007). Systems generate thoughts and actions, and sometimes a person becomes something quite different from what he was before, just by listening to his heart and doing the right thing, like Martin Luther King (Seppä 2007). One almost hilarious example of systems intelligence in action with food related context is told by Kurlansky (2002). An engineer was digging for some metals in 1846 and came across ancient bodies in an old salt mine. Realising the importance of his findings he changed his career and started archaeological excavations. His endeavour became one of the finest examples of organising an excavation with detailed bookkeeping of the findings and their details.

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[19]Only the working men were given their meagre daily rations, most of the sick had no rations at all.

Conclusion

The status of the food industry has changed completely since the time of Napoleon, when the first canned products were introduced (Toussaint-Samat 1987). Before that, the main preservation methods were drying, salting and fermenting. Household refrigerators were introduced in the 1930s. Until recently, the food industry was needed to transform raw materials from agriculture to products (Cayot 2007). Now agriculture has to deliver raw materials to the food industry fitting their specific requirements, usually by contract cultivation. Pre-fabricated foods and ready-to-eat meals in special packings are more sophisticated than ever. This increases the time and distance between raw materials and final products. The food companies are growing bigger and bigger, as are the farms that supply the raw materials. One severe problem with a global food production system is the health risks it brings along. If something goes wrong (microbial contamination, overdose of pesticides or other toxic materials), consequences are widespread, even global (see for instance Schlosser and Wilson 2006 and McLauchlin and Little 2007).

One severe problem with a global food production system is the health risks it brings along. If something goes wrong, consequences are widespread, even global.

The question of food and its quality and quantity is complicated. Part of the world has excess, while the other parts are deprived, and the little they have is often of poor quality. Obviously there is a serious global problem with food demand and supply. Food was, and still is an instrument of power. The industrialised countries have plenty of food while the developing areas are sinking in inflation, poverty and starvation. And it is not just that the developing countries have corruption and huge military expenses. The industrialised countries dump, in the name of freedom and globalism, their left-overs into the third world countries, destroying the local economy (Korten 2001; Chossudovsky 2003). In many areas of the third world it is cheaper to buy multinational milk powder than fresh or bottled milk from the local producers. One report summarises it as follows (Raman, 2006): "Less obvious and less deeply addressed (until recently) are the problems stemming from barriers to access to international markets, the high agricultural subsidies in developed countries, and these countries' export of subsidized farm products that can threaten the incomes and livelihoods of small producers in developing countries."

There are tens of thousands of children who will never know the taste of strawberry, or ice cream, or go to sleep without hunger. Who will never know what it is to have choice.

While the structure of the society is under developed, it causes serious consequences at grass root level. As the local economy in the third world has almost non-existent logistical resources, a great deal of the yield and other food supply is eaten by somebody else; creatures like mice, rats, apes, insects, moulds and other

microbes. Figures vary between 40–50 %, even 70 %. That is half or even two thirds of the food originally available! Circumstances in many areas would need an honest change for better much sooner than now seems to be possible. The faulty arrogance does not promote systems intelligent behaviour and thus restrain the change for good.

However, one of the key ideas of systems intelligence is the philosophy of optimism and faith in life, as opposed to cynicism, which assumes there is an upper limit to everything that can be done and what people can become together (Hämäläinen and Saarinen 2007). The danger of using phrases like 'limits to growth' is that it might paralyze us, create an atmosphere of hopelessness and apathy. We are part of the systems, and as we are inside the systems that shape us, we are also shaping them. This means that our feelings – optimistic or pessimistic – actions and social relationships co-create the systems we live in. Thus I am in a situation that I have been creating, and the situation has created me. Consequently I am also responsible.

And in the world of natural catastrophes and wars there are tens of thousands of children who will never know the taste of strawberry, or ice cream, or go to sleep without hunger. Who will eat their meagre portions of some grains day after day and will never know what it is to have choice. I will never forget how my teacher (many, many years ago) discussed with her class the usual diet of a malnourished child. She asked us, the well nourished teen-agers: what did we think, what does this diet do to the brains of the child, will they ever function properly? And today, science is gradually coming to realize the enormous consequences of malnutrition, as it does not only concern those who are suffering now, but also those who come after them. Gesch (2005, p. 174) concludes: "While nutrition is widely accepted as influencing long-term health, we somehow manage to decouple that relationship from behaviour with the assumption that our behaviour is purely of free will. This is despite the fact that we cannot by any means decouple nutrition from actual brain function."

"While nutrition is widely accepted as influencing long-term health, we somehow manage to decouple that relationship from behaviour with the assumption that our behaviour is purely of free will." (Gesch 2005)

One way of taking responsibility of the hunger of the world was the live concerts and songs by Bob Geldof and his colleagues[20]. A fine example of emergence in action. Most of us do not have the courage or resources Geldof had, but we all can do something. I am not saying that you should send your bread to Africa or take the next flight to a refugee camp or anything this radical. I am just suggesting that little modesty would do good every once in a while. If we found a middle-way between the extremes of starvation and excess eating then we might find a solution to the world's hunger and food related diseases (Gesch 2005). Nuances also become more visible when food is more simpler.

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[20]http://en.wikipedia.org/wiki/Live_Aid
http://en.wikipedia.org/wiki/Band_Aid_%28band%29 [2008-04-25].

In addition to that we could consider the amount of food we are throwing away in our western world of refrigerators and best before-dates. Next time could we perhaps buy a little less of something? With minimal effort the amount of waste we are producing can be cut to half, or even three-quarters. The money we would save we could perhaps use to save the world. And maybe one day every child in the world has chance to taste ice-cream and experience the hedonic sensations it brings along. Miracles always start somewhere.

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CHAPTER **8**

Developing Expertise in Sports: A Personal Journey

Susanna Rahkamo

To become a professional athlete and become the best in a sport, requires hard work, imagination, courage and the support of the right people, as well as happy coincidences that make the overall system to work. In this chapter I will discuss my own personal path as an example to develop expertise in sports. The key words are trust, self-confidence, possibility, collaboration, breaking boundaries, changing the system, hope, uplift, choice, potential, positive thinking, and systems intelligence.

Introduction

I AM A FORMER professional figure skater. My aim in this chapter is to reconstruct some of the core experiences of my sports career and look at them from the systems intelligence[1] perspective. I will also reflect on some of the key experiences of my career paying particular attention to the theme of creativity[2], as it emerged in actual practice during my years in professional sports. Much of the discussion will be phenomenological and descriptive, while some of the reflections will make use of the more theoretical discussions of expertise in sports. My chapter can be perceived as a kind of "Notebook of the Mind" (following an inspiration from John-Steiner, 1997), as applied to my own case. I apologize for the fairly self-centred tone of the chapter but hope that my somewhat unusual experience would be of a more significant, general interest.

My sport, ice dancing, is essentially teamwork. The core of that team is a skating duo and their coach. In the sixteen years that I skated with my partner Petri Kokko, we became the European Champions and World silver medallists in

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[1]Raimo P. Hämäläinen and Esa Saarinen (2007) describe systems intelligence in their article "Systems Intelligence: A Key Competence in Human Action and Organizational Life".

[2]Richard C. Dorf and Thomas H. Byers (2005) have defined the link between creativity and innovation in their book: "Creativity leads to invention and thus to innovation. Creativity is the ability to use the imagination to develop new things, or new solutions. Creative ideas flow to inventions and inventions flow to innovations."

ice dancing. Thereafter we had a successful career as professionals. Recently we were given the great and rare honour as the International Skating Union (ISU) chose one of our competition choreographies to become a compulsory dance[3] in the competition program for the ice dance events. It's a quickstep named as Finnstep after the origins of the country we come from. Thus our dance will continue to live in the skating world although our career came to its conclusion in December 2000.

I am telling in parallel my story and reflecting it to the systems intelligence framework and general study of creativity. The systems intelligence perspective brings to light categories such as choice, subjectivity, experience and shared experience, instinct, sensitivity, inspiration, emotional energy and association, without dismissing the traditional categories of control and prediction, analysis and calculation, and objectivity (Hämäläinen and Saarinen 2007).

John Shotter has offered another theoretical perspective, useful for the purposes of this chapter. Shotter emphasises what he calls "thinking-from-within" or "withness-thinking", as opposed to thinking from outside. Thinking-from-within yields insight that is easily lost in perspectives from without. As Shotter explains,

> This kind of responsive understanding only becomes available to us in our relations with living forms when we enter into dialogically structured relations with them. What we can gain in our understanding-from-within is a subsidiary awareness where the feelings are not lost in contrast to descriptions from outside. (Shotter 2006, p. 585)

In this chapter, I will try to approach my sports career "from within", hopefully providing understanding of the kind Shotter emphasises.

Our Background

Ice dancing started in Finland at the beginning of the 1980's with a few skaters and one enthusiastic figure skating coach with no experience in ice dance[4]. Petri Kokko, my ice-dancing partner to be, was one skater in that group. When I teamed up with Petri Kokko there were three ice dance couples in Finland. It would not be wrong to say that we were the pioneers of our sport in Finland. To be a pioneer was both an advantage as well as a disadvantage in our efforts to scale the heights and become the best ice dancers in the world.

It is clear now that it was both a good and a bad thing that there was no system concerning how to become world-class ice dancers. We had to find out

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[3]Ice-dance events consist of three events: compulsory dance, rhythm dance and free dance. The compulsory dances have set choreography that each couple performs after the set music. Each year ISU chose three dances from the list of about twelve dances in each age category. In every competition one of those three dances is drawn to be performed. However the Finnstep's premier is fixed to beat the European Championships 2009 in Helsinki.

[4]Ice dancing is one figure skating discipline of five: men's and ladies' single skating, pair skating, ice dancing and synchronised skating. Ice dancing consists of a man and a lady like pair skating but doesn't have high lifts and troughs. In ice dancing the couple interprets different dance rhythms in a very close contact with the partner.

for ourselves what were the critical factors needed and determine what was the nature of the skills required (Hodges et al. 2006, p. 473).

In the leading ice-dancing countries such as the Soviet Union there was a factory-like system that produced new world champions year after year. The system was very effective and the skaters became extremely skilled but the negative side of the system was that it produced very similar pairs. The Soviet style was dramatic and based on classical ballet. The performances were high quality but you could anticipate the execution. The system was effective but did not leave much room or even the need for innovation. We, on the other hand, had all the freedom to do whatever we wanted, to make our own decisions and build the team to fit our needs. Obviously we also had to carry all the responsibility and the risk. But we often said to ourselves that we would rather make our own mistakes than those of others.

When we talked about our plans with people most of them did not rate our chances of success very highly. Actually many found lots of reasons why we could not reach the top of our sport. Thinking of it now it sounds very similar to what Tom Kelley, the general manager of the world famous designer firm IDEO, writes about in this illuminating passage:

> The Devil's Advocate may be the biggest innovation killer in America today. The Devil's advocate encourages idea-wreckers to assume the most negative possible perspective, one that sees only the downside, the problems, and the disasters in-waiting. (Kelley 2005, pp. 2–3)

It is indeed very easy to find ways in which something new could fail. Fear rules easily over courageousness, as Hämäläinen and Saarinen (2007, p. 47) point out in their writing about human behaviour. It takes courage to believe in success. Luckily we had a few people who believed in us and were very supportive. Our closest and most important people to us encouraged our experiments and adventures.

Analyzing the situation carefully we could not find any real reason why we could not succeed in ice dancing if we could only organize the training at the level the world leaders had. We did not see the situation as impossible but only very challenging. In our opinion there was a chance even if nobody in Finland had truly tried it.

It takes courage to believe in success.

We set our goal to become the best ice dancers in the world. That goal would be measured in the World Championships, Olympic Games and European Championships. At that time Europe and especially the Soviet Union dominated ice dancing. We had big visions and a challenging goal. We had to come up with a strategy and a plan. To beat the Soviet skaters seemed difficult if not impossible, in the kind of dance that they had chosen.

As a consequence of this realization we saw that our best opportunity was to create a new style and in a way a new category where we could be unique, novel, thrilling and perhaps incomparable – and then built a system of training to support the uplift of that uniqueness. We analysed our strengths, weaknesses,

possibilities and threats as well as the ones of our competitors (SWOT). We were very honest and realistic about our situation but at the same time we kept our heads up in facing the challenge ahead of us; the possibility to reach the very top of our chosen sport.

Looking back, I see some key similarities in our way of thinking to what Jim Collins formulated as the Stockdale paradox in his book *Good to Great* (Collins 2001, p. 86):

> Retain faith that you will prevail in the end, regardless of the difficulties. And at the same time: Confront the most brutal facts of your current reality, whatever they might be.

I am even more surprised to note the similarities of our approach with what Lucy Suchman (2007) describes in *Plans and Situated Actions: The Problem of Human-Machine Communication* as the approach of Trukese navigators:

> The Trukese navigator begins with an objective rather than a plan. He sets off toward the objective and responds to conditions as they arise in an ad hoc manner. (Suchman 2007, p. xii, referring to the work of George D. Berreman and Thomas Gladwin)

The Trukese navigators sail very effectively towards their goals. Suchman (following the description of Berreman and Gladwin) contrasts the Trukese approach with that of "the European navigator" who "exemplifies the prevailing cognitive science model of purposeful action" and sets out towards the goal with a clear plan. Although the objective of the Trukese navigators is clear from the outset, their actual course is contingent on unique circumstances that cannot be anticipated in advance. The Europeans plan in detail and sometimes fail to benefit from the unexpected happenings and changes in circumstances[5]. We had a strategy and made plans in advance but still left room for the unexpected. We had an outline of how we could proceed but we took advantage of emerging situations and solved problems as they arose.

At an early stage of our career, we thus made choices that called out to innovation and creativity as a matter of necessity in our case. We were building our own system, not a copy of the Soviet system. After our breakthrough, a highly appreciated British ice dancing judge told us that if we had come from a country with an existing system in ice dancing we would probably never have had the possibility of even attending international competitions with our approach. The already existing system would have "normalized" us.

I strongly feel that normalizing us would have also paralysed us and weakened our strengths. In this way many systems and organisations are in a "system of holding back" where the possibilities for change and innovation are not taken advantage of but are flattened out in vicious circles as explained by Saarinen

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[5]Lucy A. Suchman (2007) is telling the story about the Trukese navigators as an introduction to her own groundbreaking discussion on human-computer interaction. Suchman argues that however planned purposefully, actions are inevitably situated actions. By situated actions she means simply actions that are taken in the context of particular, concrete circumstances.

and Hämäläinen (2007, pp. 46, 69). In opposition to this, we had the chance of proceeding without any pressure of an already existing system. We were free to do what we felt was right, mix, match and integrate insight and knowledge from different fields of arts, sports and science. We were free to develop our own system and style. As efficient and good as the discipline-based Soviet system was it left very little room for variation. As the famous economist Josef Schumpeter (1939, p. 339) pointed out:

> The more an innovation becomes established, the more it loses the character of an innovation and the more it begins to follow the impulses instead of giving them.

In business terms we were the entrepreneurs and the Soviet skating system was the established business. Like the organization researchers have pointed out:

> Organisations are developed to organize, manage, repeat and control. The needs for creative thinking are much of the contrary and need flexibility, improvisation and trial. (Garvin, Levesque 2006)

> Glue to hold the organizations in place is reliance of routine, reliability, repetition, automatic processing and memory. (Weick 1998, p. 543)

Rejecting the business as usual, innovation[6] was our ticket for success.

Gathering Information, Learning and Building Up the Team

In our case we knew that we needed to have top quality resources, would have to submit ourselves to intensive training on ice and needed to have an excellent teacher to instruct us in all there was to know about ice dancing as quickly and clearly as possible. This did not mean we had to learn the Soviet style but we needed to understand what the essence of ice dancing was and what makes good ice dancers great. We had to master ice dance techniques. Even more, we had to be able to build our task future, in order to reorient the domain[7] (Gardner 1993, p. 11).

Finland and The Soviet Union had an exchange programme for skaters in the 1980s. As part of that program we were offered a chance to practice for two weeks with the Soviet skaters in their facilities together with the world champions and their coaches. Petri had already, on two occasions, spent a two weeks period with

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[6]"A person could say that creativity is the mental work or action involved in bringing something new into existence, while innovation is the result of that effort." (Swansburg 1996, p. 55) Richard C. Dorf and Thomas H. Byers (2005, p. 114) define the link between creativity and innovation in their book: "Creativity leads to invention and thus to innovation. Creativity is the ability to use the imagination to develop new things, or new solutions. Creative ideas flow to inventions and inventions flow to innovations."

[7]Mihalyi Csikszentmihalyi explains creativity to be a process where one comes up with a new idea and the field accepts it to be a novel idea. For all the ideas there is a domain in which the new idea belongs to (Csikszentmihalyi 1996, pp. 27–28).

his former partner in the summer training camp of one of the top coaches of The Soviet Union. With these trips we gained the experience of the way top class ice dancers trained and how the "factory" worked. We learned both the intensity of the training, the quality and the amount of the teaching. We could sense their system from within. (Shotter 2006). The Soviet skaters had access to top class training facilities and they had a team of coaches each of whom were experts in their own fields. These coaches were available all the time during the training. The fact that several good teams practiced together reinforced the effect of the training. The informal competition between the couples pushed everybody to their limits.

We knew we could not beat the Soviet skaters by doing less. We had to put in the same amount of energy. The Soviet had picked the best talents in their huge country for their factory-like training system. We had no doubts that the task in front of us was nothing short of enormous.

As we began to analyse our situation we could find no reason whatsoever that would prevent us from reaching the very pinnacle of ice dancing if we not only replicated the training quality and the amount of exercise the world's best ice dancers were doing but also trained just that little bit harder. We had kind of a "mathematical" approach and believed that if we practiced more than our rivals there would be a day when we would be better than they were. We adapted the thinking that Anders Ericsson etc. (1993, p. 363) proved later in their research:

> Individual differences, even among elite performers, are closely related to assessed amounts of deliberate practice. Many characteristics once believed to reflect innate talent are actually the result of intense practice extended for a minimum of 10 years.

We did not think we were very talented but we felt confident that hard work would compensate for any lack of talent. We set our goal seven years ahead to the Olympics in Albertville, 1992. However that was not enough. As we could not reach the top in seven years we had to extend the period. It finally took us ten years to reach the top.

In the beginning we were already eager to see how far we could get. We knew that the joy of winning would only come after lots of work and there would be many obstacles in the way. In the words of Ryan and Deci (2001) we knew that a hedonistic joy needed eudaimonic action. When we were struggling with obstacles we often said to each other that maybe this was the vital phase and the decisive hurdle where everybody else stopped. We pumped ourselves with energy and motivation by saying that if the task was easy and anybody could do it, it would not be so challenging and so hard to achieve. We kept each other's spirit up and said: "if we only could work through this problem, maybe then the rest of the journey will be easier". Looking back, these thoughts were essential ingredients in keeping us on the right course.

It was exactly at this point that many of our rivals stopped trying; when faced with difficulties, and this in itself was a crucial, motivational factor in our increased determination.

A former hostage negotiator George Kohlrieser says in his book *Hostage at the Table* (Kohlrieser 2006, p. 24): "The power to control our own destiny is always with us." "Any time you feel entrapped, powerless, and helpless, you are in fact, a hostage." (p. XIV) In Kohlrieser's terms we can be taken hostage by own thoughts – thoughts that make us smaller than we could be. Petri and I believed we had a chance and we wanted to keep that chance alive in our thoughts,

It was exactly at this point that many of our rivals stopped trying; when faced with difficulties.

and not become captive to negative thoughts of doubt and disbelief. As Hämäläinen and Saarinen (2007, p. 27) put it: "There is always an opposite possibility. A pattern can be challenged."

We needed to learn fast, and felt that we had no time to waste as we were already quite old for our sport and had a radical learning process in front of us. We needed the best possible trainer so that we could learn quicker than our competitors who were at that time considerably ahead of us. Finland had an excellent exchange program with the Soviet Union but we were convinced that the Soviet system would not allow a non-Soviet team to really to flourish inside their system. Therefore we needed to look for a brilliant trainer somewhere outside the Soviet system and including the Eastern Block, which was very close to The Soviet Union and under their command.

Petri had attended one seminar session in Germany where he had had the chance to take lessons from various trainers. He had especially liked the training from a young, dynamic and already successful Slovakian trainer Martin Skotnicky. For the past four years Skotnicky had been following and assisting the legendary ice dance couple, the Olympic Gold Medallists Jayne Torvill and Christopher Dean in their training in Oberstdorf, Germany. In addition to this he had also just won a first medal in the European Championships with his own couple. So we decided to try to attend the summer camp in the superior training centre in Oberstdorf and get lessons from Martin Skotnicky. Our plan worked out and we very much liked Skotnicky's way of teaching. He had a logical and analytical approach to ice dancing technique that matched well our way of thinking.

In spite of the good experience with Skotnicky and Oberstdorf we wanted to be sure that he would be the best trainer for us and so we still explored other possibilities. During the next year we visited a leading English training facility. The British had always been strong in ice dancing and shared the podium with the Soviet skaters in the big events. We thought that they might have the capability to also lead us to the top. But the stay at the British facility was disappointing. It felt like visiting a museum. In our opinion the system was far inferior to the Soviet one. It felt that the British skating community were satisfied with what they had created in the past and were not developing their system any further. That was a mistake, we felt. We had ten years work ahead of us and Soviet skaters were not going to be lazy. After these visits to top European facilities it became very clear what was best for us. We felt intuitively[8] very sure about it. Martin

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[8] Erik Dane and Michael G. Pratt (2007, p. 33) define intuition as affectively charged judgments that arise through rapid, non-conscious, and holistic associations.

Skotnicky was to be our master and we needed to find the way to spend as much time as possible in his teaching.

Obviously it was not only us choosing the coach; we had to make Skotnicky want to coach us. Later in 1995 at the celebration of our gold medal Skotnicky told us that his first impression of us was not at all that positive. He did not believe in our future. We were already quite old as athletes at that time and had still a long way to the top. Finland was a country with little lobbying power in figure skating. Unfortunately, in those days lobbying was still very important in our sport. Luckily we were not aware of all this. This was good, as the problems to come did not prevent us from trying then.

The first years we got our training lessons from Martin Skotnicky only at hours when nobody else wanted them, which usually meant that we had them seven o'clock in the mornings. A little by little we worked our way up the ladder of the rink hierarchy and get better training hours. Skotnicky also started to pay attention to our eagerness and determination to learn. He liked to work with us and we all felt that we were on the same wavelength. This created an uplifting spiral, and a very energetic atmosphere in which to work. Hämäläinen and Saarinen (2007, p. 15) describe their systems intelligence theory this way:

> Systems create possibilities for self-supporting spirals of uplift in which people generate positive energy, excitement, encouragement and excellence through connectivity of the kind that sparks human flourishment.

This was very much what we experienced with Martin Skotnicky in these years. To our great fortune Skotnicky was hungry for success, developing also himself and very willing to share his knowledge and insights. He could teach us the skating skills but we were still handicapped. The Soviet skaters had an army of skilful trainers helping them: choreographers, condition trainers, and interpretation trainers among others. One person just could not do everything. We needed to extend our team.

Small Things Matter

Looking back, in the process of our becoming the champions, many insignificant seeming coincidences led to major breakthroughs. These followed the logic Merton (1998, pp. 276) describes as "serendipity", as not planned intentions that lead to unique and successful events.

In the beginning of the 1980's Petri, my future partner, was training for ice hockey with full force. As he had a summer break his mother, however, came forward with the suggestion that maybe he could attend an ice dance course to improve his skating skills for hockey. This happened, and Petri joined the ice dance course. People in ice dancing were excited to have this new boy among them. Petri felt flattered and because he was so warmly welcomed he decided to continue with the ice dancing after the summer, whilst still continuing to play hockey. He exercised ice dancing and ice hockey side by side.

It is remarkable how small events can make a big impact on the whole. As said earlier, in Finland there was a small team of ice dancers with very little know-how but with lots of eagerness. Our early Finnish coach, Arja Wuorvirta, was developing her skills and got in contact with top Finnish sport researchers and trainers in other fields of sports. It was through her that we got in contact with the sport psychologist Seppo Heino who had been working with top Finnish athletes. He became one of our core team members. While Martin Skotnicky was able to teach us skating skills Seppo Heino was able to teach us how to balance training effectively, how to add mental training to our daily routines and how to use visualisation as a training method plus how to handle stress during peak performance. These skills were crucial for us in our urge to develop quicker than our Soviet rivals. The tools we learned from Seppo Heino were also very useful later in creating new numbers and theatrical characters for the benefit of our performances.

In the course of the first four years we developed basic ice dancing skills. We needed to master the technique. But how to differentiate from the Soviet skaters? We decided to focus on modern dance and dance theatre, as opposed to classical ballet. We asked ourselves the kind of questions Jim Collins (2001, p. 97) describes great companies as asking: "What can we potentially do better than any other couple (company), and, equally important what can we not do better than any other couple (company)?" We understood very early what we can (and cannot) be the best of. We needed a "trademark, and that we created from modern dance and dance theatre.

Our coach Martin Skotnicky was always seeking new ideas. To improve the dance positions and lines Skotnicky hired an eccentric ballet teacher Werner Lipovski to his team. Lipovski was much more than a ballet teacher. He was not only interested about the lines and positions but also about the expressive power and content of each movement. He was a master storyteller with an excellent command of expression, feelings and theatrical effect. This highly original man started to work with us on the intensity of expression. We dived into a whole new world with him, developing new sensibilities and perceptions of what might be relevant in the ice dancing system of the kind we wanted to develop. Recall here the emphasis of Hämäläinen and Saarinen on "sensibilities" is a key part of "systems intelligence"! Through Lipovski we started to become more intelligent regarding the system we were about to develop!

Indeed, after having worked with Lipovski for one and a half years something unexpected happened in the European Championships in 1989. We finished 12th at the event, but were the only ones to get the immense reaction of a standing ovation from the spectators. We were quite unprepared for such attention and the response as we were basically quite unknown to the public. Ten thousand people were standing and clapping for minutes. An even bigger honour was forthcoming from our co-competitors. In all championships after the medal ceremony the participants have a private Prize of Honour -ceremony where one-by-one everybody gets a small gift as a memento of the event. After our names were announced our co-participants exploded into a standing ovation.

This was extremely astonishing and touching. We were again the only ones that got such special attention. In the 22 championship competitions we attended

during our career I saw such a response only a few times. I think that the skaters felt so strongly about the unfair judging and wanted to show their disapproval by demonstrating that with their standing ovation.

We understood then the power that our expression and use of feelings as well as the interplay with the spectators was offering us a possibility to develop something unique – a system of our own. Looking back, the standing ovations in 1989 were "system interventions" that helped us to develop our own system to the direction that ultimately led to the championship. The standing ovations presented to as "the single roses"[9] that triggered a positive spiral upwards (Hämäläinen and Saarinen 2007c, p. 63):

> It might emerge from something incremental, marginal, even trivial. And yet it amounts to a huge restructuring of the fundamental aspect of an entire system – because of the leverage created by
>
> > – change in the way people perceive other agents of the system as a result of a small change in the other's behaviour
> > – change in the way people perceive their own possibilities of acting with the system as a result of a small change in the system ...

After the event we were quite puzzled, pleased with the reaction we had generated but also frustrated. On the one hand we had been able to touch the soul of the audience, whilst on the other it had not impressed the judges. In spite of the immense excitement of the audience, we did not even finish among the first 10.

One result of the 1989 European Championship was that the Soviet team started to see us as a potential threat to them. The Soviet judge systematically started to judge us lower than the judges from other countries. We had no way to influence that, unfair as it was. Furthermore, as we came from a country with no traditions in ice dancing, many judges were not sure how to judge us. It was difficult for them to believe that someone could come from outside the big systems and ruling countries and create something genuinely new. We faced a lot of prejudices. Lobbyists were working hard and the deals were made between the judges, against us.

We realised that we were pawns in a game. We figured out that our chance was to influence the audience and through the audience force the judges to treat us more fairly. Basically, we needed to change the system of judging. We did not believe we could change the judges' opinions without some sort of pressure. But we did believe we could change the system.

As Hämäläinen and Saarinen wrote (2007a, p. 45):

> There is a tremendous leverage built in any human context, if only people would interpret the system as having changed. Even if it has not yet changed, it will change, when sufficiently many people believe it has changed.

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[9]Hämäläinen and Saarinen (2007c, p. 63) call a single rose-phenomenon as a single behaviour that triggers a change.

We believed that the spectators could change the judging.

The Power of the Crowds

The next big challenge was to get the spectators to demand our victory. We had to get the audience behind us in order to make them love us and look forward to our performances. The problem was defined but how to solve it? How to get the audience to become excited about our performances and to trigger the change we needed so badly? We felt that we could and should touch people's feelings and get them excited. We noticed that people wanted to connect with the dancers, feel and identify with the performances. In order to increase the effect of our performance in that realm, we started systematically to create choreographic stories with strong characters because mesmerizing characters and strong storylines made it much easier for people to get emotionally involved in the performance.

Accordingly, we studied movies, theatre and literature seriously in order to construct light and shade-effects and build a way to a climax in each number. However, we also wanted people to look forward to our pieces with thrilled anticipation. We wanted to surprise them by finding new and unexpected themes and executions. At the end of our career, to promote the surprise-element and audience expectations we started to keep our new programs secret to the last moment to create a buzz among the ice dance audience. We were building a new system to boost our effort, making new type of use of the "in-between" of the performers and the audience, on the one hand, and with respect to the judges, on the other. In a systems intelligence framework according to Hämäläinen and Saarinen (2007b, pp. 9–15) this meant to us:

1. We wanted to generate a positive outcome from the system.

2. We believed people change as the system moulds them.

3. People influence one and other far more what they think and more than is visible.

Lipovski was brilliant in theatrical expression. He was a master in bringing an already existing choreography to life. But he was not a choreographer. We liked to choreograph ourselves and were quite good at it but wanted to develop our style further still. We wanted to do something more unexpected, something unprecedented on ice. We wanted to come up with "a system intervention" (Hämäläinen and Saarinen 2007b, p. 28). And we found it – with the help of a creative personality from outside ice skating.

One day I happened to see on TV a dance piece by the Finnish choreographer Jorma Uotinen. The performance was a very theatrical and provocative number to Argentine tango music. I thought immediately that this style and treatment could also be very powerful on the ice. We were sure that that tango would not leave anybody cold. Using modern, realistic, passionate and even brutal tango in ice dance would be something radical, a bold step forward. We realized this was exactly what was needed in order to shake up the conventional skating world and take ourselves to the next level.

I called Jorma Uotinen who worked at the time as the choreographer and the leader of the dance group of the Helsinki City Theatre. He was surprised by my suggestion but as a very open minded person did not turn me down. He invited us to train with his dance group. This was frightening, but we went for it. Needless to say, we did not come across as impressive dancers on the floor, least of all among some of the best floor dancers in the country. But luckily the group very generously accepted us as equals to work as part of the group. After practising two months with the dancers Jorma Uotinen was ready to start to work on our first choreography. This was the beginning of our seven years of intensive collaboration. That started the passionate development of our own style and approach in the field of ice dance. Looking back, I perceive the decision to move ahead with Jorma Uotinen as a major change in the overall functioning of the ice dancing system we were to develop.

The collaboration with Uotinen also started our intense dance training with professional dancers first in the dance group of the City Theatre and later, as Jorma Uotinen became the artistic director of the Finnish National Ballet, with the National Ballet. Thereon we trained each spring with professional dancers and learned to use our bodies in a way that was not usual in ice dancing. We did workshops with the dancers and developed previously unseen elements for skating. It was very exciting to dive into a new world and we felt very strongly that the direction we were heading in was unique, exiting and groundbreaking. We worked very hard and humbly to master the style, as we knew that in order to win the hearts of the audience the stories had to feel real. All the details had to be believable and in place. We knew we could not fool the audience. You either touch the feelings or you do not. It took lots of discipline to get the small parts in place. And as nothing can be perfect it meant constant improvement until the deadline. What Jim Collins (2001, p. 128) writes in his book describes the mentality in our team:

> Much of the answer to the question of good to great lies in the discipline to do whatever it takes to become the best within carefully selected arenas and then to seek continual improvement from there.

Each year it took us by surprise that the crowd accepted our number long before we did. It is easier to please the audience than yourself.

One of Jorma Uotinen's strengths was the visual impact he brought to performances through his visual brilliance. As a choreographer he is almost like a painter. Therefore the visual look of the characters was also important for the whole, he emphasized. This emphasis on the visual side of the characters was something Petri and I found interesting and fun, but more significantly; it led to a shift in the sport. We created a new system. It seems to me to be of essential impact to highlight the fact that this shift occurred as a direct consequence of the actions.

With the help of the costume department first in the theatre and later in the National Ballet we enhanced the storyline with eye-catching apparel. This alone was groundbreaking and something new in figure skating where the costuming had

been seen as more or less separate issue from the performance. The costuming was typically a short skating dress decorated with sequins for women and a matching costume for men. With our tango we used street cloths, and strikingly did not use decorations. The difference to other couples was tremendous.

One thing seemed to lead to another. Uotinen's girlfriend Helena Lindgren was a make-up artist working at the theatre so she also joined our team and created a theatrical mask for each of our dance numbers. Through the work with these professionals in theatre we learned to take into account important details that enhanced the story and the emotional effect of our performance.

This kind of aesthetic-dramatic-and-holistic approach was unheard of in figure skating and caused lots of criticism and controversy. The core ice-dancing people felt uneasy with the shift of system, which happened without their control. They could not handle the situation and therefore we were criticised on almost everything: music, costuming, realistic characters, the body language, hairstyle, make up etc. People could not put their finger on what disturbed them in our performances. The president of the ice dance technical committee even commanded us to change our style as the sport could not accept such an extravagant approach and due to that ice dance would be excluded from the Olympic program. We felt this was a somewhat exaggerated comment but at the same time we were not too worried. Our strategy seemed to work: nobody was left cold and without an opinion. We provoked the judges so much that one judge said after she saw our Red Moon tango in practice that she would leave the judges' seats as soon as the Finns[10] appear. But even with the storm around our tango we jumped seven places upwards compared to the results from the previous year and finished sixth in the World championships 1990.

From there on the skating audience really started to follow us. The US TV network CBS presented us in their feature although otherwise they showed only the couples from the podium. A year later they made a portrait feature of us for the Olympics in Albertville. We were the bad kids on the block, the rivals. We brought controversy to a quite conservative sport, and the audience loved it. We also got what we were looking for: attention and the skating fans excited about us. The audiences supported us. Obviously we took huge risks but we thought we had nothing to lose. Without shaking the rigid structures we had no chances to reach the top. If the audiences had been lukewarm and unresponsive, it would have been too easy for the judges to hide us somewhere down in the results. The Finns as World Champions were not on anybody's agenda. The medals were split between the ruling countries. But the protesting audience troubled the status quo.

Because we needed to get the audience to follow us and to want to see our skating year after year, we needed to grab their attention continuously. To surprise the audience we changed our approach and the key features every year. After the powerful and intensive, even frustrating tango number "Red Moon" we came up with a light parody called "Prima Ballerina". We made a rule not to use again anything from the year before. This was challenging but forced us to invent new concepts. We changed the moves, the themes, the treatment, the rhythm of

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[10]We were called "the Finns" as our names were not so easy to pronounce for non-Finns.

moving and the look. After long held deep edges we changed to staccato type of moves, after cut lines the next program had long classical lines.

Even the colour of the hair changed a couple of times during our years. Usually skaters stay with the style they have learned and rhythm that is closest to their natural moves. By changing everything we forced ourselves to learn new things. After years of many programs our ability to master different kinds of styles grew enormously.

The Fear of the Unknown

Each year we went back to square one. Even if we built up our know-how, the development process of new programmes started from zero. In the beginning of the process we often feared that we would not be able to come up with a better number than before. We feared we could not put together a performance audiences would once again react to. It is unbelievable how uncertain you can be even after a success.

It is unbelievable how uncertain you can be even after a success.

To create, we had to get over the fear and have the nerve to jump into the unknown. It meant that we needed to let go of the control. This was hard because our society does not encourage stripping down the control. However, creative thinking requires playing with your thoughts. We noticed in our work that we needed to dare to be silly in order to be able to free ourselves from the old ways of thinking. Stepping into new areas meant that we had to take risks.

Often in the creation process, one's own expectations are so high that nothing gets through your criticism. Even the seeds of new starts are eliminated. Many times we categorised our thoughts immediately and unconsciously. Something new that is not fitting to our categories goes to the "silly" folder if we are not sensitive for new leads. However, we noticed that ideas that at the first sight seemed stupid sometimes started to grow. They allowed us to wander to totally new alleys. Therefore it was important for us in this stage to free our minds from previous ideas and expectations and let our intuition lead. This took lots of time. Obviously it is also a skill to see what is a good idea and what is not (Csikszentmihalyi 1996, pp. 47–49). Thus it was important not to go to the elimination stage too soon but try out also unconventional things and routes. But it took enormous courage and patience to trust that the process and the development would eventually work out. We had to actively push all the fears aside and trust that we would find the way and that when we worked hard the solutions would appear.

Change for Worse

It is astonishing how far-reaching the effects of the seemingly small change brought to our overall performance and to me as an individual. After our "Red Moon" tango year we had worked our way up in Skotnicky's hierarchy of dance couples. We were in second position after the French couple Isabelle and Paul Duchesnay who won medals both in European and World Championships that year (1990).

However we felt that most of Skotnicky's energy and thinking went on to the Duchesnays. In the meantime a British top coach had been talking about us very positively. He also had very strong political power in the field of ice dance. As a result, we decided to take the risk and change the environment and the coach. By then we were also somewhat tired of the small city environment of Oberstdorf and wanted to see more and get more influences. We thought that we could ourselves master the direction even in the somewhat old-fashioned skating environment in England. We had become so familiar with our team in Oberstdorf that we did not recognise its value and uniqueness and dismissed it to some extent. Thus, we moved to London.

The new British coach started to mould us gradually towards the more conventional ice dancing system. At first we did not notice this. The change took place with such small steps that it took us months to notice that we were starting to lose the soul of our approach and the direction we had so systematically created. We were losing the edge and the charm we were so proud of. The new coach was such an authority to us that it did not even ring any bells as he was saying: "To everybody else I say try to be different, but to you I am saying try to be normal." But the question was not really to be different but to find our own interpretation and unique way. The system we created with our coach started to change us in ways that were negative. As an individual, as a human being, as a woman, I did not flourish – and the result was that I flourished neither as an ice skater nor as an athlete. Finally I got sick. I got into a spiral of flus, which even after many antibiotics did not disappear. Finally, after six months and a disappointing European Championships we left England and went back to our old coach, Martin Skotnicky.

When we had left Skotnicky the previous summer we had made an extra trip to explain to him why we were moving away. We emphasized that we did not go away because of Skotnicky but because of us. Skotnicky showed his greatness when welcoming us back. He told us in a fatherly way that the children must learn from mistakes. He could have closed the doors on us but did not. Even today I am touched by his greatness as a professional and as a human being. He was such a big person that he was open to new starts. In two months we were back on track and appreciated more than ever the great individuals we were privileged to work with. After that episode we never even thought of switching the team. We learned that small things matter in both directions. The way the British coach had been holding back our development was inadvertently and with misplaced intentions been on the way of destroying us.

Resources of Creative Thinking

According to Sternberg and Lubart's investment theory[11] of creativity, creative thinking requires confluence of six distinct but interrelated resources: intellectual

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[11]The investment theory has been tested in 48 community (aged 18–65 yrs) who completed a set of tasks requiring creative performance and an assessment battery, including the Stroop Color and Word Test, the Myers-Briggs Type Indicator, and the Gough Adjective Check List.

abilities, knowledge, style of thinking, personality, motivation[12], and environment. (Sternberg and Lubart 1991)

Reflecting this to our case, it is evident that motivation played a huge role. We wanted to see how far we could go and how we could fully realise our potentials. Figure skating and ice dancing was a vehicle to try to use our capacity. The vision of being the best ice dancers in the world was strong, tempting and it made us act. We loved the everyday work. In Jagdish Parikh's book (1991, p. 7) he describes self-management in terms of business. Looking back, it strikes me how closely we were managing our lives along the line Parikh indicates. We had the purpose "why" as we were trying out our capability and testing how far we could go. We had our vision "what" as we wanted to become the best ice dancers in the world. Finally, we had the strategy "how" as we were trying to distinguish ourselves from our toughest competitors by inventing a new style and get the audience to support us. We also understood that we had to invest in our total wellness, which meant looking after our efficiency, renewal and well-being. Pentti Sydänmaanlakka[13] (2007) has developed Parikh's thoughts further and presents in his Intelligent Self-Leadership book a holistic self-leadership model, Self Ltd. which comprises of physical, mental, social, spiritual and professional departments. Total wellness, usage of one's potential and fulfilment of one's personal vision requires management in all these areas in a balanced way. It is astonishing to notice how we as athletes came to same kind of conclusions that has been proved to be compelling in theory. We came to notice that a holistic self-leadership is a must for top athletes.

The more we learned and the deeper we got into the details of ice dancing the more interesting and fulfilling it became. We loved both the freedom and the self-discipline. We loved the challenge as well as solving the problems. All of this was possible because we had the resources required for the task. We would not ever have succeeded without our great team and especially without a skilled trainer like Martin Skotnicky. The team was not together as we started but it was possible to create it. Obviously we were very lucky that we could find them and "get the right people into the bus" as Jim Collins (2001, p. 44) puts it.

Financially we could not afford the tremendous system the Soviet had for figure skating and sports but we could afford to concentrate fully on ice dancing. The bigger question and risk was losing lots of time rather than money. It was a psychological risk more than a financial risk.

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[12]Many researchers see that motivation is one of the driving forces of creative work (Amabile and Gryskiewicz 1987, p. 11; Runco 2004). The motivation is very task-focused. People rarely do creative work in an area unless they really love what they are doing and focus on the work rather than on the potential rewards. (Lubart and Sternberg 1996)

[13]Pentti Sydänmaanlakka (2002, 2005, 2007) presents in his Intelligent Leadership book series a holistic leadership model that is very much in line with the systems intelligence theory. Intelligent leadership model has been presented in three levels: organisation, team and individual levels.

Start ⟶

Reframe and
start again ⟶ Describe the problem ⟶

Build a prototype
and test it

Incubation period:
Observe and study
the problem

Evaluate and
test the ideas

Intuitive thinking
and brainstorming

Insight, ideas, and
inventive thinking
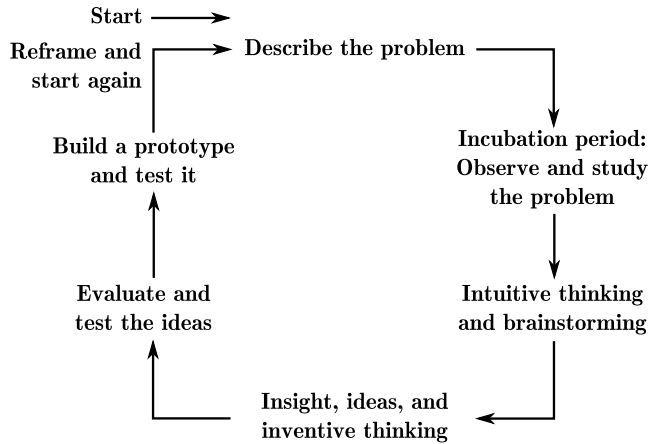
Figure 8.1: An example of a creative process (Dorf and Byers 2005).

Methods We Used

Each year we needed two new choreographies. After starting to work with Uotinen, he did one of them every year and my partner and I did the other. Also when working with Uotinen there was a lot of creative work left over for the rest of the team. To describe it, Jorma Uotinen did one loop of the creative process and the rest of the team built layers on top of that.

Figure 10.2 on page 164 presents an example of a creative process. It was developed in technological innovations but strikes to the core of our work as well. We followed a loop many times creating always-new questions to build layers on top of a current phase. The loops followed one another until the programme was ready and the deadline was met. A creative process is a systems intelligent process.

When we worked creatively we always tapped into our imagination. The imagination is formed from the skills learned in the past plus matters that we have seen and experimented with. During the creative process it was important to look inside us to let out the fusion of previously learned things. The trigger was new music or a character, which we tried to work into a new piece. We used lots of different methods to free our inner interpretation: improvisation, imaginations, idea banks, associations, relaxations, brainstorming, trial, prototyping, etc.

To prepare for the creative process we tried to take distance from what we had done before. To unload the mind and fill it with new inspiration, we were visiting theatres, dance theatres, modern ballets, circuses, galleries and museums. We went through lots of dance videos and TV shows. At the time when we were re-routing our thoughts we practiced alone, letting go from the old patterns and starting the new creation process. We wanted to be away from all the influence of other ice dancers and purposely did not watch any skating. The change of atmosphere and the people we worked with was a quick way to refresh our own minds.

1. CO-INITIATING:
Build Common Intent. Stop and listen to others and to what life calls you to do.

5. CO-EVOLVING:
Embody the New in Ecosystems that facilitate seeing and acting from the whole.

2. CO-SENSING:
Observe, Observe, Observe. Go to the places of most potential and listen with your mind and heart wide open.

4. CO-CREATING:
Prototype the New in living examples to explore the future by doing.

3. PRESENCING:
Connect to the Source of Inspiration, and Will. Go to the place of silence and allow the inner knowing to emerge.

Figure 8.2: Theory U by Otto Scharmer (2007). A Creative Process with Five Moments: In order to move from field 1 or 2 to field 3 or 4 ways of operating. We need to move first into an intimate connection with the world and to a place of knowing that emerges from within, followed by bringing forth the new, which entails discovering the future by doing.

The idea was to let go of our own habits, to empty the "work memory", so that we could access deeper levels of consciousness. We played with our bodies and skates, letting moves to develop and grow. Some days the moves got new shapes and some days they did not. We used almost two months of the spring in order to search for new ideas. Very often that was not enough time to get the choreography together, but it was usually enough to define the approach and have an adequate amount of material to design the first layer of the choreography. Then we were ready to start the work with the rest of the team.

Otto Scharmer's (2007) Theory U (see Figure 8.2) describes a creative process and Pentti Sydänmaanlakka (2007, pp. 282–283) deep learning and renewal much like we worked.

During the innovative process we often used different methods simultaneously. We tried to get rid of the critical mind and be fluent in output. We did not aim to be original but to interpret the problem with our inner perspectives. Often, if we were trying hard to be innovative, we were not. A relaxed atmosphere was very important for diving to a deeper level of consciousness.

A very typical method for us was improvisation[14]. We let the music inspire us in order to create new moves. Improvisation combined with brainstorming was useful in capturing ideas from inner feelings. Improvisation is a kind of prototyping with a strong intuition. Real prototyping came into the picture when we had produced some preliminary ideas. We needed to try out the moves and shapes to define them and work further. For building up a character we used association methods a lot. For example, when creating the character of a tramp we observed homeless people and their way of moving. To reach the roughness of a prostitute and her client in our Red Moon -tango we studied lots of movies to capture the essential essence, in what can be termed as a See it all -mentality.

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[14]Improvisation involves reworking pre-composed materials and designs in relation to unanticipated ideas conceived, shaped, and transformed under the special conditions of performance, thereby adding unique features to every creations (Paul Berliner, as cited in Weick 1998, p. 544).

Relaxation and imagination was needed in the creation of new and complicated moves that needed practising. It is hard to improvise something you are not able to execute. In the imagination, flexibility is greater as we are not limited by our abilities of execution; the flow of moves was easier to master in thoughts than in actual reality as it leaves the possibility to stop a move in the middle and examine it from different perspectives. This way we could develop and correct them. Therefore imagination was important when rehearsing. It was considerably easier to build a continuous story when working only with our minds, as we did not need to concentrate on the technique of the moves. For the credibility of the piece it was crucial not to slip out of the character. This is not easy because when you are concentrating on a difficult move you easily slip to one's own persona and out of the character. Even if that was only a fraction of a second it makes a blank moment and the character loses its credibility. For the story to flow, imagination practise is an essential tool.

It is very difficult to let the mind and body flow in an improvisation while at the same time capturing what happened. Therefore, we videotaped good flow and took notes to remember what we had done. We always tried to produce more material than was needed for the piece in hand and therefore also used idea banks to save good ideas for later use. We tapped into this resource very often.

We did not compete between ourselves as to whose ideas got chosen. We told ourselves constantly that two heads thinking is better than one head and that the good move does not state who invented it. At the end of the day we are judged on the basis of what we perform and not on the basis of who invented what. This was not always so easy and simple as your own ideas are often easier to understand and execute, as you already have them in your head. Your own ideas are also dearer to you than the ideas of the other and to be honest, sometimes you are such a narcissist that you want to prove to yourself that you have great ideas. Our clear goal was helping us there. That is why I think we succeeded in this challenge quite well even though Petri and I are both quite dominant personalities.

The Last Step

After tremendous effort we had reached the podium in the championships but had still not succeeded in winning. As we had, for years, built up controversy we figured that we had to give the judges the possibility to change their minds without face their faces. Therefore, we decided to step one step backwards and make the corrections we had been asked to make. As this would be our last effort to seal our gold medal we did something quite unconventional for our sport.

Unlike our competitors, we did not have our own judge on competition panels and we did not have lobbyists on our side. We had to find another way to influence the judges. We decided to borrow ideas from marketing and launched a pr-campaign for us in the European Championships 1995 in order to place ourselves in judges' minds as winners. I do not think that anybody really understood its purpose. We told anybody who asked that our sponsors wanted to get direct contact with the figure skating community and therefore we were placing our sponsor's booklets in the pressroom. These booklets, prepared with the help

of our sponsor's pr-department, were handsome A3-size publications with a lot of high-quality pictures of Petri and me. In the photos we were pictured like Hollywood stars. There were quotes from our fans all over the world praising us. The first page's text was as follows:

> Striving for Perfection
>
> The Finns have taken Susanna Rahkamo and Petri Kokko to their hearts. They are also spectator's favourites all over the world. They lack only one thing: a championship.
>
> Their programme often tells a story with strong feelings. Their career as amateur performers is now coming to end. That's why they have sought and prepared the right ending to their story – a happy ending.
>
> It has meant the analysis of every programme and every performance. It has meant that they must once again embark on a humble search for the fundamental answer to figure skating and ice dancing.
>
> Susanna Rahkamo and Petri Kokko have been Finnish ambassadors in Europe and throughout the world. They represent a kind of Finnishness which we all would like to emulate: technical brilliance, artistic courage, inner humility, sporting self-confidence and mental stamina. (Turunen 1994)

We asked Nokia if we could use their name and image to support our status. Getting a positive response, we had a whole page "Nokia ad" with our pictures on it and with Nokia's slogans. We believed that we could enhance our image by co-branding it with the high profile global company. In a way the booklet was intended to be a proof of our excellence, which everybody had noticed except the judges. In the booklet we also gave judges a possibility to change their minds without losing face as the booklet also stated that we had finally transformed.

When some of the judges came asking for our autographs on the booklets, we knew that something had happened! In the competition itself, we succeeded brilliantly, and with enough goodwill from the judges on our side, finally we won the championship. Of course we do not know what finally tipped the balance in our favour. It had taken us ten years to rise from the last place in the European Championships to the first. We had proved to ourselves that we could make it. After the long journey to the top we turned pro. It had taken a lot of determination, sacrifice, pain, excitement, imagination and collaboration with highly creative people. To this day I feel extremely lucky to have been able to embark on such a great expedition with a great team of individuals. I learned so much about myself, of team-work, of the power of dreaming and the power of positive energy that can make the seemingly impossible possible.

Conclusions

I hope that with my story I have been able to stimulate readers to think more broadly and beyond our case. As a conclusion, I would like to point out the most

important observations on the process of being the best. I found out that trying hard is essential but an enabling atmosphere made it possible. In my experience, who you work with, as well as your family and friends, can empower or hold back your personal development. We were lucky to have had great people around us.

We all have a choice of thinking positive even if it takes courage. However negative thinking is much more common as George Kohlrieser (2006, pp. 4–5), psychologist and professor of leadership said that he learned to understand in his former work as hostage negotiator. Fear is a basic biological feeling in most basic level and it easily leads to negative thinking. "The human brain is hardwired for attack or defence." But the human brain is also developed and we can always build an optional solution to any situation, we always have another way of thinking. Successful people are working hard in doing that.

I have had the privilege to work with great people striving for excellence. Great people passionate about their vision are fun and challenging to work with. It is challenging to always try to find the best solutions to the problems in hand. But on the other hand, it is empowering to have positive and optimistic people on your side working for those solutions. In my opinion the creativity blossomed in my team, due to the positive system that grew around our work. The enabling atmosphere made it possible to build a spiral of uplift where the seemingly impossible became possible. None of us could have succeeded alone. But together we were very creative and respecting, giving room for each other's thoughts and at the same time working hard but being humble.

Working in a team for a big vision is still not all that simple. There are many dilemmas around it: In the work there should be freedom and structure, improvisation and discipline, dreaming and performing. The process to success might need many loops and interactions and the stages might take years. A genuinely creative accomplishment is almost never the result of a sudden insight, a light bulb in the dark, but comes after years of hard work. (Csikszentmihalyi 1996, p. 1)

A group of people can have a huge impact as in our case the audience influenced the system so that it changed. It is incredible how easily thousands of people can change the system and the trigger for that can be a simple incidence, idea or a person. This is the ultimate formula for success. To be systems intelligent is to be aware of the little things that can make all the difference. The case points out how essential it is to think systems intelligently. A good leader understands this.

I ask myself as I reflect on the rollercoaster years of my career as an athlete what was the best in the personal journey to be a winner, an expert in my field. In my opinion it is great to win but the best thing is the work towards the goal. It is the daily battle towards the vision. It is not the vision but the life you are living with the people in the same system.

Taking part in a search for excellence, maintaining an open mind whilst taking into consideration the total wellness leads, in my considered opinion, to a happy life.

Success does not of itself lead to satisfaction, it is the combination of joy in the process of flourishing within a creative environment combined with objectives that you, at least, feel are attainable, and have the courage to aspire to that lead to our greatest personal treasures.

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CHAPTER **9**

Usability and Systems Intelligence

Reetta Ranne

Excellent user interface design makes instruments and everyday things usable and creates an enjoyable user experience. It can not only ease our mundane work, but also improve our mood and make tasks easier to accomplish. With future technological breakthroughs, we will increasingly interact through computational systems, often even non-consciously. When these systems work as a whole, they support the actions taken within them. A systems intelligence perspective on user interface design highlights the possibilities of systems performing miraculously well. It examines what the systems generate, how they mould us as human beings, what kind of interpersonal communication they support and how they can develop.

Introduction

O UR WORKING MEMORY is awfully limited; in general we can keep about four (e.g. Jonides et al. 2008) or seven (e.g. Miller 1956) items in our conscious mind. In order to act efficiently in the complex world, we need to expand our thinking capacity. By using exterior memory provided by different tools and devices, we can increase our memory capacity and utilise the tools adopted as extensions of our mind. Unlimited possibilities of new technologies awaits us – if we know how to use them. User interface is the composition by which users interact with artefacts. Their usability can be enhanced by designing them by means of design principles given in usability literature. Expanding the design thinking to larger instrumental systems can make it easier for us to perform in future technological environments.

Systems intelligence, a concept developed by Esa Saarinen and Raimo P. Hämäläinen in 2002, is about intelligent and successful acting within complex systems (Saarinen and Hämäläinen 2007, p. 51). When systems intelligence is applied in user interface design, the viewpoint is broadened to concern higher-level systems and their flourishing possibilities. Systems including human actors have sensitivities that can make them blossom. Systems intelligence (SI) and usability share the emphasis, where practical issues are concerned. Both accentuate the functioning of a system, which can work almost miraculously well. SI is intelligence

in acting through systems. It connects usability to the basic purpose of technology – of producing something. SI considers the context, the possibilities that can be achieved and reveals the points of systemic intervention that can improve the system tremendously.

Usability in Everyday Life

Usability has a peculiar nature of being invisible. When a device or an object you are working with is functioning, you can feel like operating through it. An object can be attractive even though it may not be that aesthetic.

My tape holder presents a wonderful example. From a set of everyday objects on my desk, it is absolutely one of my favourites. Even though it is the right colour and therefore matches the interior decoration of our study, its most important property is how enjoyable it is to use. The use of the tape holder is so pleasant that I am always looking forward to the next gift-wrapping opportunity just to use it. The holder contains sand and is therefore heavy enough so that taking the tape with only one hand is possible and easy, and the roll-out of the tape breaks neatly when needed.

A banana offers another example of nice usability. Eatable without cutlery, good biodegradable package, somewhat durable, and the opening mechanism is far better than in many vacuum packed groceries.

Even though we have marvellous usable artefacts as a part of our everyday lives, it is the awkward and malfunctioning designs that attract our attention and make us frustrated and stressed.

When usability is poor, users normally feel annoyed and might even blame themselves for not knowing the proper way to use the artefact. However, if a user cannot or does not know how to use certain artefacts, the fault is in the non-functional design, not in the user. (Norman 2002, p. 36) Everything in the surrounding environment has user interfaces. Tools, artefacts, grocery packages, furniture, rooms, facilities, infrastructure. Their level of usability varies from extreme cases of working easily and consistently with the user to in the worst case, preventing the use. We have all experienced the frustrating situation with difficult-to-use objects. The non-functioning word processor may generate cursing around the open-plan office, when refusing to work the way we want it. It is quite common to hate the technology we in any case need to work with (Norman 2004, pp. 7–8). On the other hand, there are those particular ballpoint pens that are in constant use because of their wonderful functionality that makes their users happy.

User interfaces should be understandable for everybody. If a user cannot understand the tool in the first place, working with it is impossible. As Donald A. Norman emphasises in his books, with good design, instructions are not necessary. Functioning with the artefact is intuitive and correct, since the design guides the user towards its proper use. (Norman 2002, p. 10) Usability research shows that people are quite eager to use artefacts very differently from the ways manuals are guiding us (Dourish 2001, p. 19). Additionally manuals are looked only after trying out various ways and still not achieving the wanted results.

When usability is good, we can experience our-
selves as acting through the artefact. After years
of using computers, a mouse and the hand using
it become coupled and the attention moves to the
cursor on the computer display (ibid., pp. 138–139).
The coupled use is so intuitive that what becomes
focal is the functioning rather than the artefact itself.
Natural interaction between humans and artefacts

*If a user cannot
understand the tool in
the first place, working
with it is impossible.*

takes place on subconscious level, so that the use is increasingly effortless (Norman
2007, p. 18). Proper eyeglasses afford this natural interaction. When the lenses are
correcting the vision properly, when they are beautiful and comfortable to wear,
they disappear from our consciousness, yet ease the everyday life tremendously.

Design Guidelines

In order to enhance the usability of artefacts, certain design guidelines have been
given in usability literature. As everything in the environment can be considered
from a usability point of view, the design guidelines are quite general and try to
especially facilitate first-time use. From the systems intelligence perspective, it is
essential to utilise the following somewhat overlapping design guidelines.

Affordance is a term introduced by psychologist James J. Gibson and widely
used in design thinking, especially by Donald A. Norman in his writings. Affordance-
based designing method identifies the possible actions users can perform with an
object (Sheridan and Kortuem 2005). Affordance informs where to grab, which
parts of an object are moveable and which are fixed. For instance, chairs afford
sitting, scissors afford grabbing, slots in a machine afford putting money in them,
handles on a door afford pulling, and so on. With affordances users can be guided
towards proper use intuitively without labelling objects with instructions. (Nor-
man 2002, pp. 9, 82) Klemmer et al. (2006) discuss affordances as signals especially
relevant for the human hands, which are suitable for complicated movements but
still have the property of tactile acuity. In computing, tangible user interfaces
can for instance be such that by moving a physical object in space the virtual
object moves. At the moment the best tangible interfaces can be found in the
computer gaming systems, where game controllers, such as joysticks or wheels,
can be grabbed, and where they can give physical feedback to the user as well.
(Klemmer et al. 2006, pp. 142–144)

According to Norman (2007) *natural mapping* makes human-machine inter-
action understandable and effective (p. 152). It helps the user to connect the
controls and the results. When the wheel is turned left, the car turns left as well.
Actions close in time are perceived to be connected, and therefore the feedback is
readily understandable. Natural mapping can be done by using physical, semantic,
cultural and logical constraints (Norman 2002, pp. 85–86). *Physical* constraints
make sure that a key can be placed in a lock properly and, like floppy disks, can
be inserted only in the right alignment. *Semantic* constraints rely on the meaning
of the context, and thereby guide the use. If the text on the side of a shampoo
bottle is upside-down, a user will probably place it so that the text can be read,

allowing the liquid to slide near the cap, so that it will come out more easily. *Cultural* constraints are based on the cultural knowledge users have of the object. As an example, all Finns know to throw water on the sauna stove. Consequently, a sauna, where water-throwing is automated and water need not be thrown, makes Finnish sauna users confused. Finally, *logical* constraints guide designers to, for instance, place the light switches to a congruent order as the lights are placed. The connection can be made by using equivalent colours in the controls and in the objects to be controlled.

Feedback indicates the previous actions made, and helps the user by increasing awareness of the usage (Norman 2002, pp. 27–28). Designers should aspire to a system that provides continual awareness without annoyance. Feedback reassures, makes time estimates, helps user to learn, indicates special circumstances, confirms actions made and governs expectations. (Norman 2007, pp. 138, 141) This can be provided by visible, auditory, tangible or olfactory signals. For instance the odour in gas cookers has been added so that users can more easily recognise leaking gas. The sound of the indicators inside modern cars no longer signals the frequency that the light is flashing, and the sound might indeed come from the car stereos. The function of the sound is to indicate to the driver that the turning signal is on. If the feedback can be given from multiple sensory sources, it is easier recognised and a user can act accordingly faster. This is especially useful in critical situations, where rapid responses are needed to avoid danger and accidents (Norman 2007, p. 43). If a driver is falling asleep, and is drifting away from the driving lane, the noise and trembling indicate that the car is on top of the side line. With multi-sensory signals the attention of the driver is caught fast.

Visibility makes these actions observable. In computer interfaces the turning hourglass tells us that our click was noticed and something is happening. Visibility means also enabling users to see the current state of a system and possible actions to be chosen (Norman 2002, p. 52). Visibility helps especially new users in learning the proper use. It is closely related to the feedback the system gives its user, which eases the control (Dourish 2001, p. 166). A device that does something without indicating it somehow, can make users frustrated, even though something would actually be happening. Clear visual or audio signals implemented in the user interface improves the usability.

Poor feedback mechanisms can make users confused. After having a new mobile phone for a few months, I realised that these loud sound signals appearing every once in a while were coming from it, and not from some other devices in our home. I did not know what the signals were for, because after noticing the beeping, it always took me a while to get the mobile out of my purse and see the display. It never showed any visual signals whatsoever indicating that anything would be wrong. Then, I had an idea, and made an experiment. I opened an application from the mobile phone and did not close it. After an exciting fifteen minutes it beeped loudly. I looked at it and saw that the application had closed itself. The meaning of the sound was finally found. Still, I saw no notification on this. After a month of on and off reasoning, I found out the purpose of the signal, but not once did I look it up from the manual.

Using sound as feedback is an effective way to indicate actions and signal error situations, but it needs to implicate distinctly what the warning or indication

concerns (Norman 2002, p. 102). Sound needs to be informative, yet minimally annoying (Norman 2007, p. 64). A better-functioning example of sound signals I can find from our kitchen. The microwave oven signals with different sounds every few minutes or so, if the food has not been removed from it after being heated. As the signal alters every time, it is not that easy to ignore it. Very efficient and not too irritating either.

Artefacts can be designed so that making errors will be almost impossible, and actions can be *undone* (Norman 2002, p. 131) so that no big harm is done when for instance your cat walks over the keyboard, or a child tries out the DVD-player when the parents are not watching. Also, if the device and its functionalities cannot be tried out, the variety of elaborately developed functions will not be used. People learn by doing and the more physical acting can be utilised in the interfaces, the better they are internalised (Klemmer et al. 2006, p. 141). Annoying

If the device and its functionalities cannot be tried out, the variety of elaborately developed functions will not be used.

slips in the use and accidental misuse can, and should, be prevented (Norman 2002, pp. 112–114). In many keyboards for instance the Caps Lock -key still remains as a relic from typewriters. Just compare how often you accidentally press it, and how many times you actually use it. Nowadays there are some keyboards, where the Caps Lock has been removed, but still the majority have it. Surely there are some design cases that after being standardised, are extremely difficult to change, but maybe the Caps Lock -key is not one of these.

Due to the adjustments to the standardisation, the order of the QWERTY-keyboard would be quite impossible to change radically. Similarly, turning the hands of clocks to revolve counterclockwise would cause quite a strong opposition (Norman 2002, p. 201). In some cases standardisation in similar objects is surprisingly different. Just think about the number orders in a mobile or an ATM compared to the numbers on a computer keyboard or a calculator. Similar systems, but still the numbers are in different orders.

Just compare how often you accidentally press the Caps Lock -key, and how many times you actually use it.

Because of adjusting to a certain design, a change of the brand of a mobile phone or a keyboard causes confusion, and users tend to stick with the brand they have chosen before. Similarly, a renovation of a corner shop nearby can annoy the people who are used to a different order of groceries. In order to minimise the annoyance, bigger groceries actually use the same organising style in most of their premises.

Good design has its emotional side that makes objects desirable and delightful (Burns et al. 2006, p. 9). Attractive design has been found to function better (Norman 2004). Apart from the principles mentioned above, Jakob Nielsen adds following heuristics especially for computational user interface design: The system needs to speak understandable language to the user thus creating a match between system and the real world; experts and beginners alike should be able to work with

the system according to their abilities; minimalist design is recommended so that users find the relevant information to proceed on desired tasks; and even though the systems should work without manuals and documentation, the possibility to find help on problematic issues should be supported (Nielsen 2005). Additionally systems predictability is recommended to be visible in user interfaces, so that users can anticipate what will happen next (Hollnagel and Woods 2005, pp. 90–91). Lucy A. Suchman (2007) points out that self-explanatory interfaces guide users intuitively towards the intended purpose of an artefact. This can be further developed so that computational tools explain themselves for users by advising or coaching in a suitable manner for each user towards the desired direction. As technology becomes more complex, it should still be usable with a decreased amount of training. (pp. 43–45).

Future Technologies

The landscape of computing is in a state of change once again. The mainframe era of single computers shared by hundreds of users is long gone, and the time of personal computers on every desktop is changing to expand computation throughout the environment surrounding us. Computation will spread to help us act in everyday life. (Dourish and Bell 2007, p. 414) Portable technology becomes wearable (Suchman 2007, p. 223) and it will integrate with the environment. Artefacts will have knowledge about their location and owners, and they can communicate with other artefacts and the environment (Norman 2007, p. 44).

Regardless of all the changes, certain aspects of computing have actually remained quite the same during the personal computer era. Even though the present capacity of computers is enormously larger than with the first personal computers, concrete human-computer interaction is still the same in certain respects. The user sits by a desk, uses both hands to type with the keyboard and watches the screen. (Dourish 2001, pp. 25–27) We get high-fidelity data out of the computers, but the input is very restricted. As Scott R. Klemmer et al. (2006) point out, physical use of computer interfaces has been quite far away from the richness, subtleties and coordination of physical tasks that for instance cycling can offer. The homogenised physical performance with constrained gestural movements in computing is the same for any action we do from writing to composing music and interacting with friends. (pp. 140–141) It is as if computation interfaces have understated the human way of acting. Fortunately this has recently begun to change with all the innovative gaming applications as pioneers. When computing is expanding beyond the desktops, tangibility and thinking-by-doing mentality can be better utilised by tangible interactions and performance-based acting within system. The human body is quite capable of acting extremely rapidly, if it can be used more holistically. (ibid., p. 140)

Lucy A. Suchman (2007) describes the critique towards the term *user*, since it refers to a single user who acts in standard ways (p. 188). People will be surrounded by intelligent interfaces that respond in a customised manner for every individual. Computation and technology will become increasingly embedded in the environment, and users will not even be aware using them. This *ambient*

intelligence is intended to bring about greater usability, user-empowerment and support for human interactions. (Ducatel et al. 2001) The possibilities of this technology are vast, but this research area introduces completely new social, economic and ethical implications that need to be considered. Ambient intelligence brings forth issues concerning reliability, manageability, delegation of control, social compatibility in questions of privacy and universal access, and acceptance with questions about impact on health and environment. (Bohn et al. 2005)

Paul Dourish (2001) introduces the term *embodied interaction* in his book "Where the Action Is". By embodiment he means "the property of our engagement with the world that allows us to make it meaningful" (p. 126). It is acting within the world that truly have significance to us. We encounter phenomena with embodied properties in direct rather than in abstract ways within everyday experiences (ibid., pp. 100, 189). As our environment develops technologically to become filled with embedded systems, computation becomes the central mean of functioning. In this world we operate with artefacts through computation to reach the goals we are aiming at. New technology is bringing forth novel ways of functioning and acting within technological systems (Klemmer et al. 2006, p. 146). Embodiment is about *how* the technology is being used to enhance interaction with the environment (Dourish 2001, p. 188).

Dourish (2001) emphasises that embodiment is a fundamental part of interaction (p. 102). He introduces embodied interaction to mean "the creation, manipulation, and sharing of meaning through engaged interaction with artefacts" (ibid., p. 126). He comments that embodied interaction is not a specific form of technological design, but rather a viewpoint that can be introduced to the design (ibid., p. 145).

Our desktop computers and mobile phones are becoming more and more powerful with an increasing amount of possible tasks for them to perform. Still they are frequently used for simple tasks such as sending email, checking something from the internet, sending a text message or calling and receiving calls. At the same time we are surrounded by quite different conventional devices that are highly specialised on single tasks, such as microwave ovens, vacuum cleaners and hairdryers. These specialised devices can be designed to fit the actions they are used for perfectly. Dourish points out that when computers enable users to use them in multiple ways, they can no longer specialise in any particular area. (ibid., pp. 194–195) On one hand this property enables users to do different tasks quite freely, but then again this makes the simplest tasks somewhat awkward especially for the novice users to perform.

Future technology is predicted to become filled with robots and homes that predict our intentions, recommend a healthier way of living and try to guess our emotions and play music to suit each mood (e.g. Norman 2007, Suchman 2007). When introduced to intelligent technology, perceivable affordances reveal us, how to interact with the devices and where to start (Norman 2007, p. 68).

Systems Usability

Despite great usability of a single artefact in isolation, the usage of it may still be quite difficult, if the environment creates obstacles. A television remote control can be perfectly usable, but it is normally surrounded by other remote controls of stereos, DVD-players, game consoles, old VCR-sets and multiple other devices. Suddenly living room tables are filled with various remote controls that have an increasing amount of buttons and functions. When all the equipment has different signalling systems, homes and workplaces become filled with different beeps and alarms creating a cacophonic environment that distracts and irritates us (Norman 2007, p. 58). Or, imagine a perfectly usable video conference system. If it is situated in a meeting room that is poorly lighted, the user experience will be bad, and the system will not be used. Systems usability takes these contextual factors into account.

As computation moves in increasingly novel directions, where physical objects might no longer define the use, users are no longer aware of the use itself. The usage becomes linked to other actions, other technologies and other users. Usability studies take a viewpoint of a user acting in a certain context and within a certain system. Technology users cannot be considered to be in a social, cultural and historical vacuum, but the system design needs to include other elements beyond the isolated user (DePaula 2003, p. 222).

Leena Norros and her research group study systems usability and design from the viewpoint of the activities within the system. What they call systems usability is an ecological design concept for smart objects, environments and infrastructures of the knowledge society in which we work. In addition to the traditional usability concept, systems usability emphasises integration between the different design phases and levels of detail. From usability as subjective experience to a systemic notion of usability, the artefacts are considered as a part of meaningful activity within a specific context. Moreover, artefacts are assumed to support the actions they are intended for, their functioning is easily controlled, and they make sense to their users. (Norros 2005)

Design has started to extend to large scale systems and services, and to become a way of problem solving in order to find practical solutions to wide-ranging problems (Burns et al. 2006, pp. 12–13). In addition to artefact design, larger systems are beginning to be designed, and they need not necessarily be in a material form. The concept of design changes in time and the novel ways for it to develop can be considered from the systems intelligence point of view as well.

Erik Hollnagel and David D. Woods (2005) introduce the concept of *joint cognitive systems* to the human-machine systems research, where technology and its coupling with people become embedded in the system so that there are no longer different elements, but they work together seamlessly (p. 22). Joint cognitive systems (JCS) include the user in the system, as well as the contextual environment, where the system is operating. The JCS commonly has an aspect of unpredictability. The actions that control it are non-trivial, and the outcomes cannot be forecasted easily. In addition, JCS is not merely controlled by the user, but the system and the technology are part of the dynamic process (ibid., p. 23). JCS emphasises that work almost always involves the use of artefacts as an

aid to accomplish something (ibid., p. 66). Joint cognitive systems perspective resembles a systems intelligence approach, but it is more focused on the definition of system boundaries described by certain criteria and effective control mechanisms (Hollnagel 2002), whereas systems intelligence emphasises the intelligent acting within a system, which can rarely be generalised or modelled.

As the focus of usability research broadens to include the context and the actions that are needed to be performed more widely, the systemic point of view is justified. The focus is no longer merely on a single artefact and its functions, but on entire systems. The good usability of a single object might not be enough, if the system does not support it. Therefore the functioning system and the actions performed within it become the centre of attention. The broadening of the perspective to include whole systems accentuates application of systems intelligence (SI) in design. When SI perspective is merged in the design process, holistic usability becomes of importance.

Systems Intelligence Perspective on User Interface Design

Systems intelligence (SI) relates to usability in a twofold manner. On one hand it is designing technological systems to support holistic use of systems intelligence within them by enhancing the functioning of the whole device-user-context-system. On the other hand it is performing within a given system in systems intelligent ways by understanding the context, systemic variables, parameters and degrees of freedom. Even though this chapter concentrates on the former SI point, it should be noted that within every operating environment there can be systems intelligent thinking, and therefore successful performing.

Systems intelligence emphasises the fact that in most actual situations, a human actor is an important part of a system in addition to the technical, constructed and artificial parts of it. SI perspective opens up themes that are quite fundamental to actual systems usability and yet often overlooked. As Robert F. Hoffman and David D. Woods (2005) point out, "the phenomena that occur in sociotechnical contexts are emergent and involve processes not adequately captured in either cognitive sciences or systems science" (p. 78). Similarly, systems intelligence accentuates the knowledge of both disciplines in a way that highlights the useful aspects of each viewpoint, as in the complex and cognitive systems approach of Hoffman and Woods. We can further on

We can further on design various artefacts to our needs, refine their technology and increase their efficiency, but without users and user experiences they are merely just machines.

design various artefacts to our needs, refine their technology and increase their efficiency, but without users and user experiences they are merely just machines.

By systems intelligent usability I mean such a relationship between a human agent – a user – and an instrumental object system that supports intelligent use within the whole system, but also supports the intelligence of the higher-level system that the user and the object system constitute together in the course of

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their interaction. As Paul Dourish (2001) accentuates embodiment between a user and an artefact, systems intelligent perspective describes this connection as an essential part of a larger system.

Systems intelligence is fundamentally about practice and not about theorisations. In the world of artefacts, SI thinking is focused on practicalities, and therefore on usability and user interfaces. SI is all about situational performing, and therefore it cannot be measured objectively. As Kirsten Boehner et al. (2007) point out, an objectively approached view on emotions limits and distorts emotional experience (p. 280). This can similarly happen to systems intelligence if it is perceived merely objectively. Boehner et al. question who gets to design which emotional experiences are designed for and which are left out (ibid., p. 290).

Hämäläinen and Saarinen (2007) introduce three systems questions from a systems intelligent leadership point of view. The same SI questions can be asked of usability design, with additional systemic questions.

(1) What are the systems for?

As Hollnagel and Woods (2005) emphasise, what the joint cognitive systems do is more important than how they do it (p. 22). Similarly, it is hardly of importance, *how* systems intelligence improves the system and its functions. SI is context sensitive, and therefore actions in one system are systems intelligent but the same actions in another system or in another time have different effects. When the system design is highly contextual and individually suitable for the user, acting within it becomes natural and intuitive.

In order to facilitate the systems intelligent behaviour with a certain technological system, the user interface can guide the user towards successful and productive acting. Routine tasks can be made so easy and automated that the primary goal in acting with the system can be brought to focus.

If a system for instance restricts gestural actions, as happens when using a keyboard, the thinking process of a user and interaction between other users can be quite constricted. When bodily performance is not that restricted, thought and interaction possibilities open up. (Klemmer et al. 2006, p. 141) Systems can support users to understand, interpret and experience their own emotions so that a system encourages self-awareness of emotions (Boehner et al. 2007). The challenge for future technology is to support the activities and intentions of users, complement their skills and to entertain without stressing them (Norman 2007, p. 134).

Systems can be designed so that instead of only acting in them, users can also understand them. Consequently, systems can be used more freely, the presence of designers decreases and interaction between the system and the user can begin. (Dourish 2001, p. 173) Of course this is not necessary in all technological systems. We do not need to understand the whole functioning of a car in order to drive it. However, systems have always been designed by someone and therefore their use is part of the interaction between designer and user. The designer is communicating through the user interface to the user about how the system is intended to be used. The system itself can clarify the purpose for which it was designed. (Dourish 2001, pp. 56, 132)

Technological systems are normally made to do something. The purpose of a system can be related to a work that needs to be done by a single user or multiple users. Maini Alho-Ylikoski (2008) applies systems intelligence in workplace design and describes ways to enhance systems intelligent behaviour within it. As computation spreads throughout the environment, technological systems are increasingly used for various purposes that can be nearly anything. However, it is important to realise that in addition to reaching the intended task-related goals, the use can generate emotions in the users as well.

(2) What does the system generate?

A usable system can for instance produce feelings of capability and competence, since the tasks can be performed easily and effectively. Similarly, when a system has multiple users or otherwise facilitates interaction between people, the system has an impact on the emotions of the users. A system can endorse the feeling of connectivity within a work-group, strengthen their sense of shared vision, enhance their enthusiasm, and make it easier for users to understand the emotions of others. The user experience consists of ease of usability and the emotion generated from the use. Norman (2004) highlights this emotional part of the use. Usability losses have less importance, if an artefact looks and feels nice. On the other hand, good usability can make the use so pleasant that the appearance is almost indifferent. If both of these aspects are considered, the performance can be facilitated to become successful.

When the use of an artefact generates something in its user, *how* it is done is less important than the fact that it happens. This can be utilised in the design process by asking: What is it that we want this system to generate? Feelings of enthusiasm or boredom? Efficiency or awkwardness?

(3) How do systems mould us as human beings?

As mentioned earlier, when a device is usable, we may not even be aware of the use. Easy-to-use devices actually make use of the mental models users already have. Therefore if even a completely new device fits the previous assumptions, the use becomes intuitive. Problems arise only when a system functions against our mental models and we cannot figure out its functioning principles.

The use of some artefacts can become so pleasant that we get positive energy out of them. This energy is not necessarily produced from merely the moment of the use. A user can look forward to the use, and be happy long after the use, and discuss it with others. Technical systems – like all systems surrounding us – affect users. The use can even become a part of a person's ego, raising their self-respect. On the contrary, unusable systems can create strong feelings of frustration and anxiety in the long run. People begin to avoid the use of certain devices that feel unpleasant to use. First-time use often defines the following attitudes towards an artefact. If the proper use cannot be figured out, we get frustrated and form a negative mental model about the system and the next time will hardly be any better. We do not want to use those systems that make us feel like completely different people. Even if we can feel competent, smart and

capable, when we are introduced to this technical device, suddenly everything turns around. We feel like complete idiots when using them. We press a button several times and the machine still does not give any signals of working. From the VCR-users, surprisingly few knew how to set the timer. This hardly had been the purpose of their design. Most systems seem to be created so that they are giving users the feelings of humiliation and incompetence. This is not what designers want, nor users. Nobody intends it, but still it happens too frequently.

Systems often seem to have an edge over us, which intimidates users to adjust to the system. It should really be the other way around. How can systems be designed so that they would be moulded for the purposes of users, providing ease in use, generating positive emotions, and fitting to the human possibilities better?

Avoidance of a certain artefact can create a system of holding back, where a system appears to develop in unwanted directions by itself (Hämäläinen and Saarinen 2007, pp. 26–28). An inner mental model becomes distorted, we avoid the use, and no matter how the artefact behaves in the future, we have a bad attitude towards it, and this will not change. The negative loop in the usage-system grows, and it is unlikely that anything positive could be generated. The first-time use often defines the mental models users will have of the systems and the level of holding-back. There are different users and an engineer will probably look at a computational system differently than others, and a young person probably is more ready to use new technological systems than an elderly person. Technical systems are too often designed merely for advanced users, which further differentiates beginners and advanced users from each other. Systems become merely used by experienced, and new users will never have a chance to use them properly. It is clear that advanced use needs to be developed, but it should not be at the expense of the first time user.

Most systems seem to be created so that they are giving users the feelings of humiliation and incompetence. This is not what designers want, nor users. Nobody intends it, but still it happens too frequently.

Artefacts should be designed with certain user groups or use cases in mind. Even when they are considered, the use cases often present too narrow set of possible functions within a system. Some of them may even remain improper for certain users, when the parameters to define the situation have been too restricted. How does the use of a system differ when the user is extremely happy or provoked? A systems intelligent designer considers different use cases: what can go wrong, how will certain functions affect people, and more importantly: how subjects can become moulded by a system, and how systems of holding back can be avoided?

(4) What kind of in-between does the system endorse?

As mentioned previously, systems intelligence is always about the human sensibility and therefore even the most intelligent artefact-systems cannot function intelligently alone. Subjective qualities and features of human agents affect systems tremendously. If user interface design has been planned separately from the actual

use, usability results can be quite different than intended. The higher-level system does not work because those all-too-human features were not taken seriously, but ruled out to start with.

Dourish accentuates that computation should be primarily seen as a medium, which focuses on the communication rather than on the technology (Dourish 2001, p. 162). Therefore, the meaning is created by users rather than by designers (ibid., p. 170). Visibility, a design guideline presented earlier, can refer to visibility of the activities of other users working on the same system (Klemmer et al. 2006, p. 144). It is the awareness users have through the interface systems to the actions of others, which eases the collaboration among a work team or a study group (Dourish 2001, p. 165). Intersubjectivity of a technological system appears in the ways users communicate and work through it. In addition, it is the ways the system is accustomed to be used, when the users assume it to be useful, and to what extent the users are aware of the actions of each other. (ibid., p. 133)

Rogerio DePaula (2003) describes interaction design to be an extension of the usability-centred study, where the focus moves from efficiency and usability towards empathy, aesthetics, motivation and fun. The purpose is to combine the users, their activities and the design of the interactive technologies, whereas community-centred design focuses on the interaction between people within a certain technology. The embedded technology will increasingly be used for social purposes. DePaula describes socio-computing as the ways technology is affecting social interaction, while technology is being affected by it. From the social view, technology can be considered as a means for communication, coordination and collaboration. (DePaula 2003, pp. 219–220)

Face-to-face communication differs dramatically from interaction through conventional computation. When interacting in person, slips of the tongue cannot be undone, and therefore the interaction is more committed to the moment. Through conventional computation interaction, the sentences can be deleted before sending them, and drafts of emails can be rewritten. (Klemmer et al. 2006, pp. 145–146) On the other hand, emails and forum conversations are stored, which may prevent novice users from participating in conversations. Regardless of altering ways of interaction, it should be noted that interaction always changes depending on the media.

Dourish emphasises that interaction is closely connected with the settings and the system in which it occurs. Embodied interaction is essential in user interface design, for the designed objects are a way to interact with the world. In the use of communication devices and applications, the interaction aspect of technology can be seen straightforwardly, but other objects are closely related to interaction processes as well. There are artefacts that create environments that either support or prevent interaction within them (Dourish 2001, p. 19). Social computing can be supported by organising interaction to a more informal form, as distinct from a rote procedure that is driven by a technological system (ibid., p. 160).

Interactive systems have changed our communication, so that we have become closer to each other in the sense that we can reach everyone more easily, and we are more ready to be in touch with others. However, at the same time we increasingly assume that people are within our reach all the time. When people are increasingly communicating through technology, misunderstandings happen

more often than in face-to-face interaction. (Dourish 2001, pp. 96–97) Therefore, systems intelligence considers how we can make interactive technologies diminish these misunderstandings and to improve the system in order for it to mediate the interaction correctly to the recipient.

(5) How can the systems develop?

Systems intelligence (SI) emphasises that systems have a chance to develop in various directions. Users, situations and contexts vary, and so does the need for the system to function in different ways. Even though systems are made to be used for a variety of purposes, designers have been surprised about the novel ways technology has been used (Dourish 2001, p. 171). People have adopted nice-to-use artefacts and their functionalities, and begun to use them in new situations. Even though certain settings and artefacts are designed for specific tasks or situations, designers should not restrict the actions of the users too much. On the contrary, design can encourage especially the advanced users to exploit their intuitive acting to follow the sudden inputs or systemic interventions coming from outside the system or within it. Systems intelligent actor sees the systemic points of impact and seizes the moment. User interfaces could facilitate this.

Systems can guide users and support the use to be easier and less stressful, but it is the intelligent actions user does that makes systems flourish.

A systems intelligent designer utilises the intuitive possibilities systems have. Designers can have visions about usage possibilities of the system. Still, opportunities need to be left open so that the artefact can be tailored by the user. Only users can define the best ways to use systems in their own ways – which usually differ quite a lot from the assumed ways (Dourish 2001, p. 160). There are plenty of examples of design that users further develop to their own directions. And this is where SI design should aim. Even though user interfaces can be developed to become even more usable, more attractive and more efficient, the emphasis is after all on the user. Systems can guide users and support the use to be easier and less stressful, but it is the intelligent actions of the user that make systems flourish.

Systems intelligence emphasises the fact that certain designs do work extremely well. The focus is moved from the usability faults to good examples, which can be further utilised in other designs as well.

Design can support various actions within a working system, but it can also support the user not to accidentally harm the system, and prevent wrong choices. By restricting some possibilities of acting a system can guide the user towards finding out its possibilities faster. If a system allows users to do almost anything, the actual use after several dead ends can be so frustrating that users never achieve the point of flying with the system, and will not find better ways to act.

When the culture of households is studied in order to provide assistance,

designers try to find things that people have difficulties with. The focus is on larger phenomena, where simple solutions could have greater positive effects. (Norman 2007, p. 125)

Systems intelligence emphasises the fact that certain designs do work extremely well. The focus is moved from the usability faults to good examples, which can be further utilised in other designs as well. It is about the positive attitude and optimistic approach. The amount of everyday things around us is huge (Norman 2002, p. 11), some of them we have chosen to use and others we have not (Hollnagel and Woods 2005, p. 99). In addition, there are technological systems that are used as tools within different situations. These systems include artefacts that work almost miraculously well. Systems intelligence turns to these, finds out what these systems generate, and encourages the designers to utilise the positive examples in other systems as well.

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CHAPTER **10**

Facilitator's Systems Intelligence in Business Process Simulations

Rita Lavikka and Jukka Luoma

The SimLab[1] business process simulation method is aimed at facilitating holistic thinking about the management of complex networks of business processes. It involves the building of conceptual process models and using these models as common points of reference in a facilitated group discussion during a simulation day. The simulation day is an interactive process in which process models are tools for organizing knowledge. In this chapter, we examine the process of facilitation in SimLab process simulation projects from a systems intelligence[2] perspective. We investigate the actual process of applying the process simulation method using three "systems questions"[3]: (1) What does the system generate? (2) How does the system mould us as human beings? and (3) What kind of human in-between does the system endorse? We describe how the facilitator needs to be holistically oriented and, at the same time, sensitive to unique context-specific features of the facilitation process. We conclude by reflecting on how the systems intelligence perspective might contribute to the self-reflective improvement of actual facilitation practice.

Introduction

OFTEN, BUSINESS PROCESSES constitute complex inter-organizational networks such as demand-supply chains, inter-organizational R&D alliances and networked service provisioning (Smeds et al. 2005, p. 1). This *modus operandi* requires *systemic process management*. Cross-functional and interorganizational processes are comprised of complex networks of interdependent activities and involves a plurality of stakeholders and interests. The challenge is to coordinate the activities of collaborating parties in order to improve the value-creating networks' effectiveness and/or efficiency while accommodating different stakeholder interests.

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[1] http://www.simlab.tkk.fi

[2] http://www.systemsintelligence.tkk.fi

[3] These questions were originally presented by Hämäläinen and Saarinen (2007a). The questions are meant to reveal important characteristics of a system from a leadership perspective.

Business process development approaches (Smeds et al. 1994, Hammer 1990, Davenport and Short 1990, Davenport 1993, Hammer and Champy 2001, Chang 2006) provide support for organizations in this challenge. Business process development creates improvement through better coordination as well as through learning and building of common understanding. Starting from acknowledging the pitfalls of sub-optimization and recognizing the need for a holistic approach to process management and development, conceptual process models and process development methodologies are aimed at *facilitating the process of holistic thinking about business process management and development.*

One such approach, the SimLab™ process simulation method (see Smeds 1994, Evokari and Smeds 2003, Smeds et al. 2003, 2006) aims at *creating a space for knowledge sharing and creation* (Smeds and Alvesalo 2003). This is to facilitate the emergence of new ideas, common understanding, improvement of practices and coordination, and/or collaborative thinking (see Jaatinen and Lavikka 2008). The aim is to create such conditions in a simulation day which includes facilitated group discussions and group work sessions. The method embeds business process modelling which is an activity that supports participatory process management.

This chapter explores the actual process of applying the SimLab process simulation method. We describe the key phases of the process. Our emphasis is on *facilitation* which is a cornerstone of the method. Our contention is that a successfully facilitated process simulation project requires that the facilitator is endowed with capabilities that transcend methodological skills that can be acquired by instruction. We use the concept of *systems intelligence* (Saarinen and Hämäläinen 2004) to highlight the 'something more' than 'methodological skills' needed in the facilitation of process simulation projects. For this purpose, we describe how *process simulation projects* can be understood *as systems*. We conclude our chapter with a reflection on how such a systemic perspective might contribute to a facilitator's cultivation of her practice.

Developing Organizations through Improving Business Processes

The SimLab process simulation method can be seen as one example in the wide range of process-oriented approaches to organizational improvement. To set the context for the method, we briefly describe some historical landmarks in the field as well as some recent developments.

In 1960, Levitt underscored business organizations as customer-satisfying processes – in contrast to viewing them as goods-producing or technology-developing systems. Aguilar-Savén (2003) describes Levitt's (1960) customer-orientation manifesto, put forward in his classic article in the Harvard Business Review, as a landmark in the emergence of business process orientation in developing organizations. Aguilar-Savén (ibid.) describes the 1990s as the upswing decade of such process focus. Since then, a number of methodologies and models have been developed to support analyzing business processes, discussing and learning about them as well as making decisions concerning them.

Earlier approaches, such as business process re-engineering (Hammer 1990,

Davenport 1993, Hammer and Champy 2001), took organizational improvement as something to be planned-and-implemented through radically restructuring business processes. One could say that, such view of organizational change equates organizations with machines and change management with engineering. This results in ignoring the 'human issues' of process improvement, including the cultural, cognitive and emotional dimensions of organizational change (see, e.g., Davenport 1995, Melão and Pidd 2000). More recent business process development literature acknowledges the inadequacy of the machine metaphor of organizations alone. Complementary ways of understanding business processes include seeing them as dynamic and feedback-intensive systems or as social constructs (ibid.). For instance, when business processes are viewed as social constructs, they are no longer taken as 'things' to be manipulated from the outside. Rather, they are

> made and enacted by people with different values, expectations and (possibly hidden) agendas. ... abstractions, meanings and judgements that people put on the real world. (ibid., p. 120)

As to improving business processes, Melão and Pidd note that

> existence of multiple (and often conflicting) views about what is going on and about how the process is being and should be carried out means that a different view of change is required. It implies that changes should result from a process of negotiation of conflicting interests, difficult though this process may be. (ibid.)[4]

The shift of though, that Melão and Pidd describe, has implications for process improvement practice. To summarize, important implications include the following. Process improvement practice is no longer equated with engineering (as in business process re-engineering), but is rather part of process management practice. As a result, modelling is primarily considered as a means to organize knowledge, not as a means to represent business processes as objectively existing 'things'. It is a tool that *supports* process management practice. Moreover, matters of stakeholder participation and, consequently, group dynamics becomes increasingly important when 'improvement' is considered contingent on interpersonal communicative processes that constitute process management. In this process, the modeller, as part of an organization or as an external consultant, becomes more a facilitator than an expert.

The SimLab business process simulation method supports organizations in participatory planning and learning about business processes. The method has been developed and its application process is studied through an action research approach (see, e.g., Gummesson 2000). It has supported several process development programs of business and non-profit organizations. Business process simulation projects are set up to support these programs. The researchers are responsible for organizing process simulation projects and acting as facilitators during the simulation day.

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[4]Similar paradigm shifts have occurred in the fields of systems thinking (see, e.g., Jackson 2003, 2006; Midgley 2000) and operations research (see, e.g., Midgley 2000, ch. 9).

The method takes into consideration that process improvement is part of process management practice rather than as a purely technical endeavor. The method utilizes modelling as a decision-support tool in process management rather than as a means to represent reality objectively. Its evolutionary, participative approach to developing organizations reflects an appreciation of the business-processes-as-social-constructs perspective. One rationale for a participatory development process is that people often resist changes, particularly if they have not been involved from the beginning of the change process (Smeds 1997b). The simulation method helps in overcoming this barrier to change. It increases the likelihood of implementation of the development ideas by promoting participation of employees from all hierarchical levels into the development process.

If business processes are understood to be *made and enacted by people*, then organizational change and, thus, development, realizes only insofar as new procedures are implemented by people. Senge (1990) argues that new ideas fail to get put into practice because they conflict with people's mental models[5]. Senge's argument is at odds with the outlook on SimLab process simulations, or other process improvement methods, as merely an technical enterprise. Process modelling does not yield development ideas that the facilitator can impose on the participants as 'objective necessities'. Rather, models facilitate an interpersonal learning process. In this process, the facilitator raises questions concerning the processes but lets the participants themselves decide what improvements should be made to the processes. The participants are empowered to take responsibility of their challenges and decisions concerning improvement ideas. Thus, the facilitator needs to be equipped, not only with methodological expertise, but, also with leadership capabilities.

Business Process Simulations for Process Development

SimLab process simulation method

The process of applying the SimLab process simulation method (Smeds et al. 2006) includes the following phases (see Figure 10.1 on the facing page):

1. Setting goals for the development project, e.g., which processes to be developed

2. Modeling the selected business processes

3. Interviewing relevant parties that are involved in the process

4. Preparing a process simulation day

5. Organizing a process simulation day

6. Analyzing results

7. Giving feedback to the people that the possible changes affect
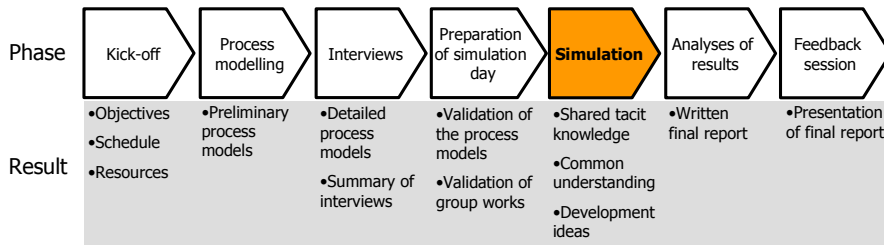
Figure 10.1: The phases of the SimLab process simulation method.

Typically, a process simulation project of this type lasts about three months. During the project, researchers create models of selected business processes in collaboration with the case companies. The culmination of the method is a simulation day on which the key people of the selected processes, already existing or under development, are gathered together to discuss process development opportunities. The simulation day includes a facilitated group discussion in a facility where process models are projected onto a large canvas. The expression 'simulation' refers to the interactive group discussion during which participants together develop ideas concerning processes under inquiry. The simulation does not involve any numerical computations. For such process simulation approaches, see, e.g., Harrison et al. (2007) and Davis et al. (2007). The simulation day also involves group work sessions for further development of the improvement proposals.

The simulation day provides an interactive learning environment that provides a platform for building common understanding among the participants. In knowledge management terms (Nonaka et al. 2000), the interactive simulation facilitates sharing and combining tacit knowledge as well as combining explicit knowledge. This is achieved through joint discussions where participants of the simulation day share their experiences and best practices as well as discuss improvement opportunities (Feller et al. 2005).

A process model as a boundary object

Process modelling produces common points of reference *for the discussions* of the the simulation day. In other words, the process model acts as a "boundary object" (Star 1989, Smeds et al. 2006). Process models facilitate combining and sharing tacit knowledge through using process models as vehicles of translation. This provides means to create and share understanding of business processes and their development needs. Moreover, participants can use process models to discuss better ways of coordinating interdependent activities. Obviously, participants interests may conflict, especially in inter-organizational process development projects. The use of process models helps dealing with conflicting interests because the participants can use them to build *mutual understanding about where*

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[5]Mental models are defined by Senge (1990, p. 174) as deeply held internal images of how the world works. They are images that usually limit people to familiar ways of thinking and acting.
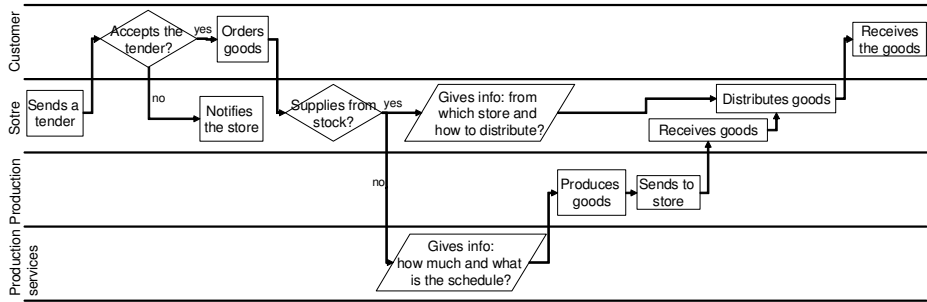
Figure 10.2: An example of a process model that could be generated by business process modelling method (modified from Checkland's (1999, p. 172) conceptual system model).

and to which degree their viewpoints and interests conflict. In this way, they can more effectively deal with the plurality of perspectives. One could say that the emphasis is not on modelling for the sake of optimizing but, rather, in order to facilitate discussions and learning (cf. Checkland 1985).

Figure 10.2 depicts a simple model[6] of an order-processing system that could be used on a simulation day. Hypothetically, the participants could, e.g., point out and discuss potential bottle-necks in the order-delivery process as well as identify new ways to organize the process. Participants could share their experiences and ideas by referring to the process model projected on a wall. This makes it easier for the participants understand as well as to comment on each others' ideas and experiences.

Viewing process models as boundary object is consistent with the position that problem solving support should focus on interpersonal communicative processes (see, e.g., Schein 1987). Process models, as a common points of reference, ease communicative processes between participants, so that they can focus more effectively on sharing and jointly constructing knowledge through their engagement in the discussions during the simulation day. Process models are tools to direct the focus of the simulation day towards a common development object.

Outcomes of process simulation projects

The process simulation day creates a space for knowledge sharing and creation (Smeds and Alvesalo 2003). More specifically, what ultimately amounts to an 'improvement' may involve trust-building, building of an open and a collaborative atmosphere, development of new and re-organization of existing processes, building of common and more comprehensive understanding of relevant business processes. Thus, it is not always that clear what will eventually constitute the improvement. The simulation day provides a platform where the participants, with the help

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[6]This process model applies the notation of flow chart technique. The boxes represent activities, diamonds represent decisions and arrows represent the direction of flow of information. Process models can also be modelled using some other notation which is usually decided based on the needs of the customer.

of the facilitators, can share and jointly construct knowledge. It is up to the participants to generate – again, with the help of the facilitators – the outcomes that the client (e.g., the organizations with stakes invested in the process) regards as improvement. Although the nature of improvement may not be entirely known beforehand, it is still something that process simulation projects apparently *can potentially generate*. Next, we introduce the concept of systems intelligence that can shed light onto SimLab process simulation projects as improvement-generating processes.

Systems Intelligence Perspective on Process Simulation Projects

Clearly, there is always 'something more' than 'appropriate methodology' combined with 'methodological expertise' involved in *actual process simulation projects*. In Checkland's (1999, pp. A33–34) words,

> Never imagine that any methodology can itself lead to 'improvement'. It may, though, help *you* to achieve better 'improvement' than you would without its guidelines.

Our attempt here is to use the concept of systems intelligence to frame the practitioners' or facilitators' competence manifested in the *actual process of applying* process development methodologies, using the process of applying SimLab process simulation method as an illustratory example.

According to Saarinen and Hämäläinen (2007, p. 51), systems intelligence is "intelligent behaviour in the context of complex systems involving interaction and feedback". Systems intelligence emphasizes the human potential and tries to shift the focus on human action (Hämäläinen and Saarinen 2007a, p. 4). Hämäläinen and Saarinen (2008) describe systems intelligence as a key competence of a facilitator in *decision and negotiation support*. See also related discussion on systems intelligence in the context of *systems practice* (Luoma et al. 2008).

Process simulation as a system

Consider *the process of undertaking SimLab process simulations as a system*. It is composed of parts such as a facilitator, process models, and participants involved. The system is set up to generate learning, shared understanding, and change proposals. In this way, the system addresses and relates to some problematic situation. To illustrate this idea, Figure 10.3 on the following page portrays the simulation day as a system (step 5 in the method, see Figure 10.1 on page 163). Figure 10.3 depicts some elements in the system that contribute to the dynamics and outcomes of the simulation day.

Three systems questions for process simulation facilitators

Hämäläinen and Saarinen (2007a) present three systems questions that serve to reveal important characteristics of a system that a leader needs to be *intelligent*
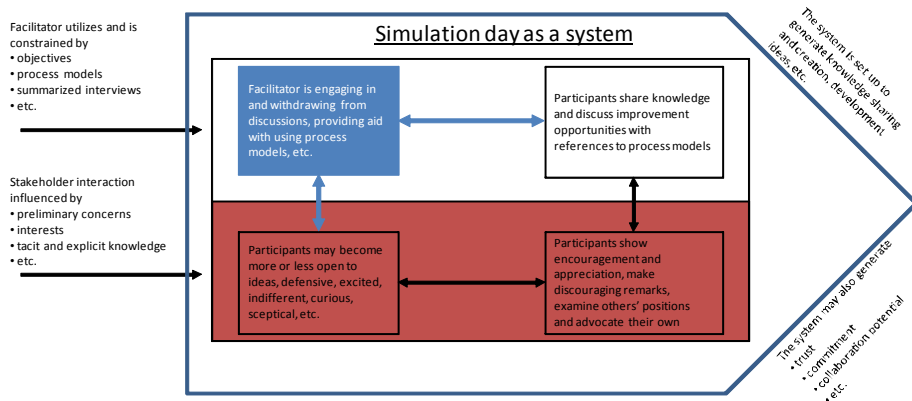
Figure 10.3: The simulation day as a system.

with. We examine the same set of questions as potentially revealing important characteristics of the system that the facilitator of the process simulation project needs to be intelligent with.

(1) What does the system generate – and to what extent is this what we want?

Obviously, the process of applying the SimLab process simulation method, or the system, generates objectives for the development project (step 1, see Figure 10.1 on page 163), facilitator-led interviews (step 3), models of selected business process (steps 2 and 4), a set of interrelated activities called the simulation day (step 5), analyses and communication of simulation results (steps 6 and 7). A proportion of what the system generates is predictable in that they result from the facilitator working within the guidelines of the method. However, this is but a fraction of what the system generates.

The facilitator needs to be holistically oriented and, at the same time, sensitive to unique context-specific features of the facilitation process.

Take for example the simulation day (step 5, see Figure 10.1 on page 163) on which the involved stakeholders get together to discuss with and about the process models developed earlier (through steps 1 to 4). The system also generates new ideas, shared understanding, conflicting viewpoints, frustration, excitement, disapproval, mutual encouragement, openness and withdrawal. The facilitator is *part of this system* responding to what is happening around and to her. In doing so, she is contributing to what the system generates.

Clearly, the facilitator's actions have a pivotal role in shaping what the simulation day as a whole comes to generate. These actions include her managing and organizing efforts, the expert knowledge regarding the process simulations

that she provides. She also chooses, more or less, her communicative actions on a moment-to-moment basis. The method can help her to an extent. However, the emphasis is placed on the idea that, in addition, she has to operate intelligently *with* the system, e.g., on the simulation day, without the luxury of drawing upon a ready-to-use method or tool. Yet, she has to act, and, indeed, she is able to do so, facilitating the discussions so that the system comes to generate mutual understanding about the interconnections between people's tasks and ideas about how they could improve their existing processes.

A key point to be made from a systems intelligence perspective is that, to a significant extent, the facilitator is figuring out her actions on the fly, she is thinking on her feet in order to somehow – to use a phrase from Stacey et al. (2000) – "get things done". She is endowed with capabilities to act that are not limited to the "explicit, knowledge-like ... propositional, symbol-intensive and analytic" (Hämäläinen and Saarinen 2007b, p. 298). She complements these with relational, situational, implicit, empathising capabilities in order to cultivate the system so that it brings about betterment.

(2) How does the system mould us as human beings?

The SimLab process simulation method guides the facilitator to draw people's attention to the interdependences of activities and the coordination of people's tasks. Following the steps of the method moulds people in that the process of using the method confines discussion to particular themes. As a result, participants enter the scene as advocates of an organization or a part thereof, or as decision makers who control the necessary resources to make particular changes, to name but a few roles. Moreover, people may perceive themselves as active participants whose input is considered valuable but may also experience the role of a bystander who is just there to make the process *seem* participatory. These examples reflect ways in which the system, i.e., the simulation day, might *mould people*. The facilitator has a key role here.

Yet, again, this is not merely a concern of choosing a proper method and using it properly. The facilitator needs to be mindful of the fact that her actions will pay a crucial role in how the system moulds people. She is acting prior to, e.g., the simulation day, but also during it. When the system is being whatever it is, becoming whatever it becomes, the system is affecting whether people are open to ideas, defensive, excited, indifferent, curious, sceptical, encouraging; whether they are in a cooperative or competitive mode. Further to this, if we take the facilitator's embeddedness in the system seriously, she is also being moulded by the system.

The way in which the system moulds the participants as human beings, in turn, is partly observable as part of what the system generates. Therefore, if what the system generates is to be taken seriously, it is to be kept in mind that the first system's question is intimately intertwined with the second one. The way in which people act is co-determined by the subjects themselves, and their systemic environment. To the extent that the facilitator has a say in 'setting up' the systemic environment of, for example, a simulation day, she is affecting

how the system moulds people and, thereby, contributing to what the system
generates.

(3) What kind of in-between does the system endorse?

Systems' questions one and two view the system from the perspectives of what
people generate (as a system) and how this system *moulds people*. A third way of
describing the system is to focus on what is emerging in the context of applying
the process simulation method as something that emerges "in-between" people.
Stacey et al. (2000) highlight the fact that social interaction is more than mere
exchange of material resources and flows of information. More fundamentally,
interaction is the human way of *being*. From a facilitator's point of view, this
means, e.g., that she is inseparably a part of, or immersed in, the system. What
the system generates does not result from the facilitator engineering the system in
a mechanistic manner, but from her being immersed in the participatory process.
She is taking part and standing back from discussions, summarising discussions
and providing her own viewpoints. In doing so, she is evoking actions in others.
She may not be able to objectively grasp how her actions will unfold and, yet, she
needs to act *knowing* her actions *will most likely have an impact.*

From the point of view of the above three systems questions, *the process of
applying SimLab process simulation method* has features that are "too transient,
idiosyncratic and forward-coming to allow us the luxury of them becoming neatly
conceptualized and perceived as objects (Hämäläinen and Saarinen 2007b, p. 297).
The concept of systems intelligence draws focus on the fact that, even so, the
facilitator – together with method(s) employed and participants involved – is
able to act in order to help an organization to improve its processes and enhance
learning among the participants. She is using her intelligence that manifests itself
not only through her prior-to-action, or in-between-actions, reflection, but as part
of her actions.

Conclusions

Procedures, methods and models can, to an extent, help organizations in the
challenge of holistic process management. From a systems intelligence perspective,
it is, ultimately, the dynamic process of communicative interaction between
individuals, which gives rise to 'improvement'. It emphasizes process development
guidelines and methods as parts of this improvement-seeking process. From the
systems intelligence perspective, the system that the facilitator has to be intelligent
with appears much wider than a narrow focus on choosing the right means and
ensuring a proper use of chosen means. She engages herself with the situation
which unfolds itself as the interconnections and interactive processes between the
participants. As a result, the facilitator will most likely be dealing with situations
for which no ready-to-apply solution is available.

In process simulation projects, the facilitator has an interest in cultivating
the simulation day *as a whole*. After all, her success or failure is determined
by what *the simulation day as a system generates*. The systems intelligence
perspective emphasizes that all she can do is act, on her own behalf, in her own

local environment. However the optimal impact would be that, through her reciprocal influence with the system, her actions may accumulate to changes that make a difference to the whole. To an extent, she can "plan and implement" these actions. Yet, the system will give rise to properties and phenomena that cannot be dealt with in a plan-and-implement fashion. As a result, the facilitator needs to be holistically oriented and, at the same time, sensitive to unique context-specific features of the facilitation process.

On the one hand, the systems intelligence perspective pinpoints the humanly rich character of process simulation projects. Appreciation of the myriad interconnected elements involved in process simulation projects, may make them appear as increasingly complex, as increasingly more difficult to manage. On the other hand, the systems intelligence perspective maintains that humans are already endowed with capabilities for coping with such fabulous complexity. Moreover, if the facilitator has an influence on the whole through her own participation, anyway, there will probably be some sort of hidden potential in the system as actions that she could take.

The concept of systems intelligence highlights the facilitator as being capable of acting productively *with respect to complex and humanly rich wholes*, such as the simulation day. She is able to act – *as part of the whole* – in ways that have a positive impact on the whole, despite the vast complexity of the current or desired status of the system in propositional terms. Her *intelligence with the system*, i.e., her systems intelligence manifests itself as part of her actions. Moreover, systems intelligence is an empowering concept that invites facilitators to make more and better use of their intelligence-as-part-of-their-actions in order to improve their practice of facilitation. This complements other approaches that are aimed at increasing the facilitator's competence through a better understanding and mastering of facilitation procedures and guidelines.

How can one improve one's competence in being holistically oriented and, at the same time, sensitive to context-relevant parameters of the whole, so as to bring about betterment through one's actions? Becoming more competent in this respect is not exclusively about adopting explicit prescriptions for action. After all, explicit prescriptions are generic in nature and thus they omit contextual parameters. The systems intelligence perspective highlights some foci of attention that perhaps contribute to portraying a wider understanding of the facilitator's competence. For practicing facilitators, the systems intelligence framework might highlight new opportunities for self-reflective improvement of their own practice.

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Infant Research and Systems Intelligence: Some Observations

Väinö Jääskinen

The infant and the mother form a system that has been studied by both psychoanalysis and experimental development researches. Synthesis of these fields extends our knowledge of how the infant develops. The infant has complex mental structures and capabilities already at birth. She is capable of attunement, i.e. has the capability to share feelings without delay. From a systems intelligence perspective this opens up the possibility of conceptualizing through infant capabilities adult human action particularly in the dimension of the non-verbal and the implicit. The systems intelligent infant as a concept can enrich both infant research and systems intelligence as an intellectual framework.

Introduction

IT STARTS RATHER simply, or so one might think – a baby is born. In a relatively short period of time, she develops into a complete personality. But what exactly happens during those crucial first months of growth, both mental and physical, that changes the infant almost day by day? A key finding of developmental research is that the development of the infant does not happen in isolation, but quite the opposite. Interaction between the infant and her environment is a crucial part of the process of becoming a human being.

In recent decades infancy research has undergone several major changes. Firstly, authors like Stern (1985) have combined the perspectives of clinical psychoanalysis and experimental infancy research in a way that helps us to ask new questions and to answer old ones. Secondly, a systems perspective on infant-development has been developed by Beebe and others[1]. Drawing from the tradition of psychoanalysis and developing new kinds of approaches, this point of view has shed light on the complexity of infant-development.

A key assumption of much of the most interesting infant research is that the infant is intelligent. What kind of "intelligence" is it? In particular, is intelligence

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[1] See e.g. Beebe at al. (2003a) for an introduction.

exhibited by the infant a form of systems intelligence as defined by Saarinen and Hämäläinen (2004)? This is the question explored in this chapter.

But what does systems intelligence mean and why is it a relevant concept in this context? There is no single exhaustive definition, because systems intelligence is more of a research program than a completely formed and articulated theory. Under its umbrella a number of themes have been discussed, ranging from the productivity of nations and corporations, to leadership, architecture and the human-connectivity aspects of the therapeutic patient-therapist relationship. However, all of these points of views share one common characteristic that is the belief in the possibility of human action to bring about positive change. The emphasis is on action as opposed to articulated rational knowledge. Although intellectual framings have their place and value, most situations we face in actual life are too complex and emergent to be approached by rational analysis. Yet we somehow manage and cope. As Hämäläinen and Saarinen (2004) put it:

> By Systems Intelligence (SI) we mean intelligent behavior in the context of complex systems involving interaction and feedback. A subject acting with Systems Intelligence engages successfully and productively with the holistic feedback mechanisms of her environment. She perceives herself as part of a whole, the influence of the whole upon herself as well as her own influence upon the whole. By observing her own interdependence in the feedback intensive environment, she is able to act intelligently.

Why approach infant-development from the point of view of systems intelligence? One reason is suggested by the theme of the infant's self-expression. Although the idea of the infant's pre-verbal communication with mother has been recognized for quite some time, it is only recently that researches have started to appreciate its complexity fully. Combining this fact with the common sense notion that most of the time the infant-mother system *works* in that obvious sense that a healthy human being emerges out of a system that no-one can describe even in retrospect, makes one wonder, how successful human action is possible in such a complex and epistemically opaque situation? This is exactly what systems intelligence tries to study and understand.

This chapter does not try to build a systems intelligent theory of infant development. Rather it reviews some main ideas of the theories that take the idea of "the systemic infant" seriously. Then the question presented earlier is studied in the light of these theories.

Before proceeding on to these theories, I try to frame the question of what kind of a system is the dyadic mother-infant relationship. There seem to be three distinct principal systems involved:

1. the infant

2. the mother

3. the interpersonal mother-infant system.

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The interpersonal nature of the system means that there is more to the situation than just the presence of two separate human beings, as also the relationship between them is critically important.

Stern's Theory of the Infant's Interpersonal World

Daniel N. Stern's book *The Interpersonal World of the Infant* (1985) has as its subtitle "A View from Psychoanalysis and Developmental Psychology." This describes well Stern's way of combining these two different approaches to infant development. But what is so special about this?

To simplify a delicate and complex issue is to say that psychoanalysis focuses on words, e.g. on the way the patient verbalizes her past. This enables the reconstruction of events of the early life. There can be difficulties in handling experiences, including also preverbal experiences. However, the point is to approach those problematic experiences with the instrument of words. On the other hand, developmental psychology is interested in neurobiology and cognitive functioning of the infant's mind. Stern develops a synthesis that takes into account both of these.

I am not trying to cover all the ideas in Stern's book, but will rather concentrate on his ideas concerning development of the infant-mother system.

There has been a tradition in infant development research to propose different kinds of developmental stages, and Stern is not an exception. His model consists of four stages. They are about developing a sense of the self and the other. These stages and their properties continue to effect the infant's mind even after a new stage has been reached.

The stages are

1. Emergent Self

2. Core Self

3. Subjective Self

4. Verbal Self

Because I am concentrating on preverbal forms of communication and consciousness, the verbal self is left out of the following developments.

Stern gives us rough estimation of when the stages manifest themselves. The emergent self appears at the age of 2 months. The core self appears at the age of 2–7/9 months. The subjective self appears at the 7/9–15/18. The verbal self appears at the age of 15/18 months onwards.

Emergent Self

This stage starts from birth and lasts about two months. The self of the infant is at a very early stage of development. However, according to Stern (1985), intelligent behavior can already be detected in the infant's actions. The central question is how to understand the infant's experience of the world. Stern argues

that the Freudian theory of "stimulus barrier" is inadequate and it has to be at least revised. Stern describes what he calls a revolution in infancy studies, related to "posing questions" to infants. Stern describes one such method:

> The newborn does not have good control of his or her head and cannot hold it aloft in the upright position. But when lying on their backs so that their heads are supported, newborns do have adequate control to turn the head to left or right.

Stern then goes on to describe how it has been shown that infants can recognize smell of their mother's milk. Brest milk was put on two different pads which were then placed on two sides of the infant in question. Her head movements were registered and it was consistently observed that the pad with the mother's milk was preferred.

Another way to "ask" infants something is to take advantage of the fact that they are good suckers, being one condition of their survival. Infants like to suck to gain nutrition and also for pleasure. By using artificial nipples, interesting experiments can be conducted. A slide carousel can be wired with artificial nipples to give the infant control over what she sees. Thus it is possible to know what kind of images the infant prefers.

A third method is to use vision as a mechanism to figure out what is going on in the infant's mind. The infant can move her eyes, because those muscles are under voluntary control. Gaze movements tell where the infant is focusing on.

These three methods make it possible to study what kind of structures the infant has in her mind, although these have to be inferred indirectly. Stern reports that infants prefer vertical symmetry in the vertical plane to symmetry in the horizontal plane. It should be noted that parents usually line themselves in this manner.

Core Self

The formation of the core self starts at the age of two months and lasts for about five to seven months. There are two distinct sides in the formation of core self. They are Self vs. Other and Self with Other. Both are very important.

Formation of the core self is dependent on many different stages of development, also known as self-invariants:

1. Self-agency

2. Self-coherence

3. Self-affectivity

4. Self-history

Self-agency means the feeling that the infant is in control of herself and has the ability to guide her motions in a meaningful manner. It consists of three invariant

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experiences: the sense of volition, the feedback and the predictability of actions. The infant starts to form motor plans so that guided movement of limbs is possible.

Self-coherence is the subjective feeling of wholeness that encompasses the fact that all the bodily and mental characteristics of the infant in fact belong to the same entity. Without coherence there can be no agency. The locus where the infant's core self resides starts to form at this stage. It means that the infant has a certain feeling of being in one place at a time. The infant starts to understand that the similar movement in time of some objects means that they belong together.

Self-affectivity refers to the invariant nature of feelings that the infant has. Feelings like joy, fear, anger etc. have different, recognizable effects on the feeling person and they are relatively stable throughout lifespan. For example, the infant can recognize that the sadness she feels in different situations is in fact one feeling and not just separate experiences. On the other hand, joyfulness of the infant and the adult are pretty similar when it comes to respiration, facial expressions, subjective feelings etc. These feelings are both internal and external because they involve objects outside the infant's sphere of experience (the Other), and also its own bodily functions, like rise in heartbeat as a sign of excitement. One interesting finding is that when presented with many instances of one feeling (joyous faces etc.) the infant forms a model and then has the capability to recognize the feeling in another context. For example, when the infant learns to be afraid of something, this new feeling can take place in different contexts which do not necessarily have anything to do with the original situation.

Self-history is a property of memory. It makes possible the continuity of the infant's mind and her experience of self. It is the uniting property which enables the mind to work. The infant has memory that cannot be accessed directly. This phenomenon is also evident in the adult experience. We cannot always remember everything and often our mind works on issues and themes without us explicitly understanding it.

One important concept is that of episodic memory, that can be understood as whole comprising of the different self-invariants described. It means that the infant (and the adult) remember things in clumps or episodes. These are made of sights, sounds, smells, feelings etc. The important conclusion is that facts can almost never be perceived without feelings. The human mind works in such a way that it always attaches some feeling to episodes in memory. This makes the memory system effective and robust but it also sometimes makes it difficult to be objective or to understand how the infant thinks.

Development of With Other differs from the traditional views of symbiotic relationship of the infant with the mother. Stern criticizes Winnicot, Mahler and others for their idea of the undifferentiated image that the infant has about the mother-infant system. According to this view the infant's mind conceives the "I" and the "we" as one and same. Stern states that present account takes into consideration the very early development of core self. With this view comes the problem:

> If we conceive of being-with experiences as the result of an active integration of a distinct self with a distinct other, how can we conceive of the subjective social sense of being with an other? (p. 101)

This question comes to mind also in the context of the social experiences of adults. For example, if someone dies the memory and presence of the deceased is often very lively in the minds of those who knew her.

The social experiences and the matrix of social relations are something that has to be understood in the context of "self/other" differentiation problem. Stern approaches the question by considering experiences that infant cannot reach by herself. Games like "peek a-boo" and "I'm going to getcha" are typical examples where the infant's excitation and feelings are dependent on the social interaction.

In his book, *Child's Talk: Learning to Use Language* Jerome Bruner (1983) states that in games like "peek a-boo" it is important that the child is given a more active role as her skills develop. Bruner describes a "motto" for these kinds of games: "where before there was a spectator, let there now be a participant."

These ideas are very similar to the Fogel's idea of alive communication (Fogel and Garvey 2007). Fogel and Garvey instruct us to go beyond simple theories of sending-receiving in communication. There are lots of processes going on that have to be taken seriously if we are to understand the mother-infant system and its communication structures.

Subjective Self

After the core self has been formed, there develops in the infant's mind something that is called the subjective self. What does it mean? The basic idea is that the infant becomes aware of the existence of mind, both of her own and of her mother's. This subjective experience enables new kinds of actions. This happens between seven and nine months after birth. The infant's mind is capable of doing many things. She can want to do something ("I want to sleep"), she can have emotions ("This is frightening"), she can have a focus of attention ("Look at mom"). It boils down to the theory of other minds, a question pondered by philosophers for centuries. But for the infant, it is not a question of theory, but rather a very true part of her life and subjective experience and also a condition for survival.

Two interesting concepts of this stage are intersubjectivity and attunement, which are concepts about the sharing of feelings. What evidence there is for intersubjective relatedness? Because infants at that stage of development are still preverbal, the experimental methods devised to study this have to be quite clever. Stern proposes three mental states that can prove or at least illuminate the existence of the infant's interpersonal world and the infant's awareness of the separateness of minds. They are:

1. Joint attention

2. Sharing intentions

3. Sharing affective states

Joint attention can be described by an example provided by Stern. When the mother points at something, the infant at this stage understands enough to stop looking at the finger and start looking at the object that is pointed. But that is not

all. The infant can then look at her mother for visual feedback and information on what to think about the object. The infant also starts herself point at objects. All of these things prove the existence of complex mental systems working inside the infant's mind, Stern points out.

Sharing intentions is another instance of the intersubjectivity systems working. When an infant wants something, she can point at it, make sounds and she may also try visually to send a message to her mother, all this in order to get the object she desires. The remarkable thing is, all this is preverbal.

Sharing affective states means that the infant understands that she and others have feelings. For example, when an interesting, buzzing toy comes to the infant's range vision, she might not know what to think about it. But she can look at her mother for a visual clue on what to do. If the mother looks frightened by the toy, this same emotion can also be evoked in the infant.

By attunement Stern means the act of synchronization between actions of the infant and the mother. Attunement is about the sharing of feelings. But they do not have to be big and important. They can be little and down-to-earth. Rhythm can be very important in this context. Stern gives us an example:

> A nine-month-old girl becomes very excited about a toy and reaches for it. As she grabs it, she lets out an exuberant "aaaah!" and looks at her mother. Her mother looks back, scrunches up her shoulders, and performs a terrific shimmy with her upper body, like a go-go dancer. The shimmy lasts only about as long as her daughter's "aaaah!" but is equally excited, joyful, and intense.

Here it seems to me that the infant has capabilities which can be easily overlooked because of their preverbal nature.

Intersubjectivity: A Systems View

Theories of interaction are important for psychoanalytic theory, because the patient-analyst relationship develops as a process of interaction. Beebe et al. (2003a) bring forth a systems view of the therapeutic encounter. They suggest that the concept of intersubjectivity is important in understanding the way communication unfolds between the patient and the analyst. They borrow ideas from infant research literature, for example Stern (1985).

After certain age a child can express herself verbally. On the other hand, nonverbal communication can be very important for an adult, so these categories are not mutually exclusive.

Beebe et al. offer us three proposals which have guided their thinking. Here they are in abbreviated form:

1. All theories of intersubjectivity are about interaction. They can be examined based on how much they adopt a systems view, which integrates findings from infant research and psychoanalysis.

2. Different levels of cognitive development are important in understanding intersubjectivity. Distinction between presymbolic and symbolic intelligence has to be made.

3. "For a theory of intersubjectivity to be most generally useful for psychoanalysis, it must address both verbal and nonverbal, more recently conceptualized as explicit and implicit."

Another important distinction is between verbal and nonverbal. When an infant develops a theory of mind, i.e. a theory about existence of the minds like her own, the cognitive development speeds up and the possibility of verbal expression becomes viable (Beebe et al. 2003a).

The idea of a theory of mind is important for understanding intersubjectivity in the dyadic mother-infant system. It is through a mutual recognition of the intersubjectivity that the infant and the mother achieve a stage where their interaction works for the benefit of the system. However, this recognition in many ways is not explicit or verbal because the infant is preverbal and on the other hand because the mother does things intuitively based on her instincts rather than intellectually analyzing the situation and developing rational plans. But when time passes and the system evolves, this can change. There comes more and more space for rationality and calculation. And the infant can exhibit qualities that clearly are based on the theory of mind, like pointing at things she wants etc.

Peter Hobson's book *The Cradle of Thought* (2004) elaborates the interplay of the infant's mind and actions of others. He points out that there is a clear difference in how the infant perceives other people as opposed to inanimate objects. Hobson writes: "Being affected by others is a design feature of human beings – a design feature that transforms what a human being is."

Because of differences in the way the term "intersubjectivity" is used in different contexts, Beebe at al. suggest we replace it with "forms of intersubjectivity". This term captures the fact that there are many possibilities in the domain of intersubjectivity. By talking about forms of intersubjectivity we take into consideration that there are clear differences in the way adults and infants operate. However, there are also lots of similarities, which make this fascinating area of study.

Forms of Intersubjectivity in Infant Research

Beebe et al. (2003b) synthesize findings of three infant researchers, Meltzoff, Trevarthen, and Stern[2]. One of the more interesting points here is the fact that the infant's sense of self starts developing through motion rather than by construction of mental structures. The feeling of being and the capability to move are pivotal in forming the self.

Meltzoff's work relating to imitation tells us about the infant's ability to recognize imitation in the facial and other expressions of the mother or other adults. The youngest infant to be shown imitating was only 42 minutes old!

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[2]I consider Beebe et al.'s synthesis quite illuminating and therefore I present it here.

According to Meltzoff, the connection between the self and the other is created by the cross-modal functioning of the infant's mind and body. The fundamental experience of "you are like me" makes it possible to directly access the other.

Trevarthen's arguments are summarized by Beebe et al. as follows:

1. "Infants possess an emotional and communicative brain at birth."

2. "The basic dimensions through which intersubjective coordination occurs are time, form and intensity."

3. "The infant is aware of, and shows a preference for, contingent effects. The human brain is specialized for mutual regulation of joint action."

4. "The infant coordinates perception and action through a single time base."

5. "The most basic mechanism of intersubjective coordination is matching of communicative expressions through time, form and intensity, across modalities."

6. This intersubjective matching occurs through use of rhythms and sharing common time base ("an internal clock").

7. Cerebral representation of self and other is not necessarily based on limb movement or moving in general but rather on the "image" of those actions, i.e. the complete impression made by them.

8. There is a difference between primary (self and other) and secondary (self, other and object) intersubjectivity.

From the list above we can see, that Trevarthen's argumentation is very close to that of Meltzoff. They both share the idea of the creation of self being a process that is strongly related to the biological nature of the infant and to the intersubjectivity of the dyadic relationship.

I will not elaborate Stern's theory in this context in detail because that is done already in the previous section. However, Beebe et al. point out interestingly the concept of attunement which is important for understanding Stern's thought.

Affect attunement is about connection of feelings at a level outside of normal awareness. As mentioned before, by attunement the mother and the infant can experience same feelings at the same time. That is how the mother-infant actually becomes an interdependent system of two human beings.

Intersubjectivity: Implications

Beebe et al. (2003c) take ideas presented above and use them to highlight some important conclusions for psychoanalysis. The forms of intersubjectivity that are presymbolic form the base for the symbolic development.

Meltzoff, Trevarthen and Stern share the idea of "shared mind" which completely shifts the psychoanalytic theories of "autistic" or isolated mind. This helps us understand the difference between conventional view of the closed mind and the metaphor of "shared mind."

Enter Systems Intelligence

Systems intelligence can be approached from different angles. Hämäläinen and Saarinen (2007a) suggest we consider three systems questions. They are relevant in the context of infancy studies. They are:

1. What does the System generate – and to what extent is this what we want?

2. How do systems mould us as human beings?

3. What kind of in-between does the System endorse?

These are useful to apply for inspecting the case of the mother-infant system. This leads us to consider the active, dynamic functioning of the system in question. In a nutshell, structure creates behaviour and vice versa.

What kinds of problems are possible in the interpersonal mother-infant relationship? One possibility is that of holding back. Hämäläinen and Saarinen (2006) describe system of holding back through a rose-buying case. They ask, why so few Finnish men buy roses to their wives on normal weekdays and why the wives lack romantic spirit and gestures. Their answer is that there is system of holding back which is so powerful that the persons inside do not even recognise the system as something that governs their action. Holding back has thus negative consequences or at least it prevents good things from happening. It can be postulated that life could be better for all concerned if the system of holding back were unleashed. But this is non-trivial. First of all, the system must be recognised and the will to change something has to merge.

What might holding back mean in the infant-mother case? Perhaps the mother does not communicate enough with the infant who in turn becomes more and more passive. A vicious circle is created. What starts as a small thing grows and grows and may even become a serious problem. Without outside intervention it can be difficult to change the system.

Systemic intervention starts from recognition of a problem. Or even if there is no evident problem, there can be a sense, or a hunch that things could be better.

What parenting does to the mother? She changes physically, psychically and socially. Of course for the infant changes are total as her personality develops. The capability of intersubjectivity that is already present at a very early stage changes and grows and affects other areas of development. Without implicit cognitive skills learning for example language could be very difficult. This is how the mother-infant system changes its sub-systems.

The question of in-between as understood in the systems intelligence literature is a little trickier. Here it can mean the intersubjective mother-infant relationship, a some kind of emotional "space" where the mother and the infant can act. And they act, intensively. Beebe et al. (2003a) point out that the concept of intersubjectivity is meaningful and has gotten much attention lately.

Implications for Systems Intelligence

It seems that infant research demonstrates that we as human beings show capability to function systems intelligently almost straight after birth. As the self of the infant develops, there come new phases and possibilities.

What can we learn from infants that has relevancy for systems intelligence? The mother-infant system evolves through time. The mother's role changes as the system evolves. The mother has to take different roles at different times. The dyadic system turns into a system of two different human beings. There is also the question of what Hämäläinen and Saarinen call the human-in-between. The possibility to be in relation with another person is a distinct human capability which makes our lives more meaningful and rich. Without that kind of element it would be difficult to build stable human structures like families, or nations. What is more, it would be impossible to become a human individual, breakthroughs in infant research teach us.

Systems intelligence is about the little extra that makes human action successful. For example two strangers can meet for the first time and still bond strongly after only few words or seconds. This is possible because of our inner attunement abilities. And it is not far-fetched to suggest that this is reminiscent to the working of the dyadic mother-infant system. There is intelligence at play although it is not articulated, verbalized, objectified or rationalized.

There are similarities in the way the mother-infant and the patient-therapist system work. These are important for systems intelligence thinking, because of the significance of the "moments of meeting" as a form of the human-in-between. As Lyons-Ruth and The Boston Change Process Group put it (1998):

> In summary, these moments of intersubjective meeting are experienced and represented in the implicit relational knowing of infant with caregiver. They are also experienced in the patient-therapist interaction, with similar resulting changes in the patient's implicit relational knowing. These "moments of meeting" between patient and therapist may or may not become the subject of interpretation. Nevertheless, these moments of meeting open the way to the elaboration of a more complex and coherent way of being together, with associated change in how relational possibilities are represented in each participant's implicit relational knowing.

I suggest that this idea should be generalized. It is something we can use every day when we are "connected" with others. That is systems intelligence in action.

Hämäläinen and Saarinen (2007b) sketched some questions for systems intelligence in the context of infant research. I suggest that one further point can be indicated on the basis of this chapter: the attunement of the infant-mother system is very similar to that of strangers meeting and instantly feeling connection. Hämäläinen and Saarinen (2007b) write:

> Our systems endowment, the human systems intelligence we possess as human beings, was far more than ability to think about and know

about systems, we felt. The systems endowment is not only about explicit, knowledge-like and propositional, symbol-intensive and analytic capabilities with systems, notwithstanding the merits of such a quintessentially human acumen.

Studying infants can help us understand some key features of systems intelligence. The infant acts systems intelligently without explicit, articulated or symbolic knowledge. Yet she somehow usually succeeds. Importantly, this does not happen in isolation. The human-in-between of the mother-infant system supports the infant's success and development. It can be thought that strangers meeting are using their special human endowment that dates back to infancy. This happens without rationalization or objectification. Of course the idea of learning about adults by studying infants is not new in itself. But by applying systems intelligence to the case, we can go one step further.

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CHAPTER **12**

The Nature of Social Systems in Systems Intelligence: Insights from Intersubjective Systems Theory

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Systems intelligence is about the ability to act intelligently in systems we are embedded in. Among the most important and fascinating are the systems which we confront in the everyday: the immediate encounters between two or more human beings. Systems intelligence assumes that micro-level social phenomena can be meaningfully conceptualized from the point of view of systems. Intersubjective systems theory (IST) of Stolorow, Atwood and Orange provides an insightful articulation of such systems. In this chapter we suggest that IST yields remarkable support for the systems intelligence approach. At the same time adopting the intersubjective systems perspective makes us more aware of the subtleties of the context and thus opens possibilities for us to become more systems intelligent[1].

Introduction

SYSTEMS INTELLIGENCE IS conceptualized as the subject's ability to act constructively and productively within an emergent whole as it unfolds even while lacking objective knowledge, models or codes (Hämäläinen and Saarinen 2007a, p. 5). It accounts for "an individual's non-rational, non-propositional and non-cognitive capabilities, such as instinctual awareness, touch, 'feel', and sensibilities at large, as capabilities that relate the subject intelligently to a system" (Hämäläinen and Saarinen 2006, p. 193). People prereflectively read situations as systems and are able to act intelligently based on that prerational knowledge. Thus we already have much intelligence that we can apply – and indeed do apply – in complex environments and social situations; endowment that amounts to a sort

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[1]We are grateful for Professor Robert D. Stolorow for comments on an earlier draft of this paper.

of "intelligence as part of moment-to-moment human aliveness" (Hämäläinen and Saarinen 2007c, p. 297). This is the insight of systems intelligence in a nutshell.

An evident underlying premise of systems intelligence is that there indeed are some sort of systems in play in our environment that our intelligence can get a grasp on. In this chapter we want to focus on the systems we see as some of the most fascinating and important; those between human beings in the context of an immediate encounter. The essential question then is: what sort of a system constitutes the basis for face-to-face social encounters?

In this chapter, we present one possible conceptualization of the systemic understanding of immediate human interaction: the intersubjective systems theory developed by Robert Stolorow, George Atwood and Donna Orange (see for example Stolorow et al. 2002, Stolorow 2004). We shall argue that IST captures remarkably well many of the intuitions that underlie the systems intelligence paradigm[2].

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IST has been developed as a metatheory of psychotherapy and it reflects profound experience from that practice. In effect, IST reflects the experiences of thousands of hours of clinical therapeutic work by Stolorow, Atwood and Orange. The idea is to provide a perspective that captures the immediate, close-range human encounter of the therapeutic encounter better than the more traditional approaches. The original theory is primarily focused upon the therapeutic system formed by a patient and a therapist but the theory is here generalized to apply to other types of local encounters and face-to-face interactions between two or more human beings. While remaining truthful to the original insights of Stolorow et al.'s theory this generalization sheds remarkable light on the nature of human interaction in immediate social encounters. Apprehending and internalizing the perspective is valuable for anyone who wants to understand social encounters and be able to operate in them with greater systems intelligence.

We suggest that the two theories are connected in three important ways. Firstly IST provides a background rationale for the existence of systems intelligence in face-to-face social situations. Secondly SI complements intersubjective systems theory by pointing out constructive ways of acting in the complex social situations IST describes. Thirdly, acquiring the IST perspective makes us more sensitive to the subtleties of any particular system and is thus likely to enhance our Systems Intelligence.

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[2]In a separate article we study how intersubjective systems theory and systems intelligence could join forces to overcome the objectifying bias evident in mainstream therapeutic theorizing (Martela and Saarinen 2008).

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Background of the Intersubjective Systems Theory

We shall first set the overall context for the intersubjective systems theory, by indicating some general developments in psychoanalytic thinking in the past two decades. In psychoanalytic theorizing a forceful movement has emerged that approaches the psychoanalytic practice in terms of relationships, systems and contextual parameters. The previously dominant, Freudian based and Cartesian background assumptions have been challenged among others by Kohutian self-psychology (Kohut 1959), by Marcia Cavell (1991, 1993), by American relational theory as represented in the work of Stephen Mitchell (1988) and Lewis Aron (1996), and by the work of the Boston Change Process Study Group (Stern et al. 1998; Stern 2004; Beebe et al. 2003; Boston Change Study Group 2003). An essential element in this shift is a departure from Cartesian, objectivist and positivist approaches to perspectivist approaches (Beebe et al. 2003, p. 743) as exemplified by a variety of theorists, including Reese and Overton (1970), Silverman (1994, 1999) and Hoffman (1998). Some of the most fruitful advances of psychoanalytic thinking have been drawn from developmental psychology, particularly as exemplified in the groundbreaking work of Louis Sander (1985, 1991), Stern (1985) and Beebe and Lachmann (2003). Another source of inspiration comes from the findings in cognitive psychology and neuroscience (see Fosshage 2005). The ideas of Thelen and Smith (1994) that build on the theory of dynamic systems has also been influential. As Alan Fogel suggests, the concept of *system* is the central intellectual contribution of 20th century thinking (Fogel 1993, p. 45). The systems perspective lays ground for a fresh and rewarding perspective on human interaction, enriching the relational in human-centered studies that amounts to "thinking of everything as relational through and through" (Rorty 1999, p. 72). It is in this context where the intersubjective systems theory finds its home.

Intersubjective Systems Theory

The intersubjective systems theory approaches psychological phenomena "not as products of isolated intrapsychic mechanisms, but as forming at the interface of reciprocally interacting subjectivities" (Stolorow and Atwood 1992, p. 1). In opposition to traditional psychological and psychoanalytical theories which are based on the often implicit "Myth of the Isolated Mind" (Stolorow and Atwood 1992, p. 7), the intersubjective field theory of mind states that psychological phenomena "cannot be understood apart from the intersubjective contexts in which they take form" (Atwood and Stolorow 1984, p. 64). The perspective seeks to overcome the subject-object dichotomy and aims to address the essentially affective and prereflective nature of a social encounter.

In order to appreciate the importance of the intersubjectivity perspective of Stolorow, Atwood and Orange, we must start by briefly examining the notion of the Cartesian mind that has provided the dominant background paradigm for psychology, psychoanalysis and everyday understanding of human beings[3].

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[3]In this analysis Stolorow et al. rely much on Charles Taylor's (1989) classical analysis of the modern concept of the self in western culture.

From the Cartesian perspective the mind is seen "in isolation, radically separated from an external reality that it either accurately apprehends or distorts" (Orange et al. 1997, p. 41). The mind is conceived as an essentially atomistic and self-enclosed entity detached from the world by the infamous subject-object split (Stolorow et al. 2002, pp. 21–23). The mind is "a thing that has an inside and that causally interacts with other things" of which it can have more or less correct ideas about (Stolorow et al. 2002, p. 31). The external world and the mind are thus two separate and independent entities that are somehow able to interact with each other. When perceived in terms of these often tacit Cartesian intuitions, a therapeutic situation is seen as involving the patient as an isolated subject and in terms of an objective analyst who is trying to influence the patient from the outside.

The intersubjective systems view puts out an alternative theory which is based on a radical rejection of "the myth of the isolated mind". The view is most explicitly elaborated in the collaboration of Stolorow, Atwood and Orange and published as Worlds of Experience (2002). Using Heidegger (1962) as one of the main philosophical sources of inspiration[4] Stolorow, Atwood and Orange base their understanding of the human condition on "a post-Cartesian contextualism that recognizes the constitutive role of relatedness in the making of all experience" (Stolorow 2004, p. 553). Here the Cartesian dualism between internal and external is challenged because the thing we experience as the external world is in reality only the product of our subjective understanding of it. Our experience is always shaped by our psychological structures "without this shaping becoming the focus of awareness and reflection" (Atwood and Stolorow 1984, p. 36). We never experience the world itself directly. The only thing we ever experience is our own interpretation of it.

Stolorow et al. call their stance *epistemological perspectivism*. It "embraces the hermeneutical axiom that all human thought involves interpretation and that therefore our understanding of anything is always from a perspective shaped and limited by the historicity of our own organizing principles" (Stolorow et al. 2002, p. 76). Following Gadamer (1991) they state that human understanding always takes place inside "our own present horizon of understanding" that is influenced by our past experiences

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and our own individual life histories. Every subject has subjective background structures or principles that organize and define how the world is experienced. These Stolorow et al. call *structures of subjectivity* (Stolorow and Atwood 1992, p. 2) or *organizing principles* (Stolorow et al. 2002, p. 45)[5]. These structures

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[4]Along with Heidegger, this view is inspired by the concept of Lebenswelt (lifeworld) of Edmund Husserl (1970), by the concept of être-au-monde (being-toward-the-world) of Maurice Merleau-Ponty (1962) and by Wittgenstein's (1961, 1953, 1958) ideas of contextuality of meaning, language games and forms of life (Stolorow et al. 2002, p. 33). Also gestalt psychology, hermeneutics, postmodernism and thinking of Mikhail Bakhtin (1981) have inspired the underlying contextual thinking (Orange et al. 1997, pp. 71–73).

[5]They are also called the prereflectively unconscious (Atwood and Stolorow 1980) because

are not static but amount to an experiential system of expectations, interpretive patterns, and meanings (Stolorow et al. 2002, p. 45). The subject cannot be viewed apart from these structures; the subject is both the product of these structures and the organizing gestalt that produces these structures (Stolorow et al. 2002, p. 35). These structures – operating mainly outside the awareness – determine what we can feel, know and experience in particular situations (Stolorow et al. 2002, p. 45). Because different contexts awaken different patterns and possibilities of interpretation, the subjectivity itself must be seen as "thoroughly contextualized" (Stolorow et al. 2002, p. 69).

A comparison with sight might clarify the idea of perspectivism. As we look at the world we see objects: trees, computers and books, girls and boys. When the experience of sight approaches our cognitive awareness it has already gone through various prereflective filters that have organized it. The prereflective unconscious already attaches meanings and affects to these objects. It tells us which objects are worth our conscious attention and which objects we should ignore without even noticing them consciously. When looking at a crowd we immediately notice our aunt or the guy wearing the same t-shirt as we are wearing while the faces of fifty other people simply fade away and become "the rest of the crowd". The so-called cocktail party effect provides another example of this prereflective filtering. In a noisy and crowded party we can still listen to our friend speaking and ignore the noise from other conversations around us. Still, if someone at the other side of the room mentions our name we are able to notice it immediately and are able to focus our attention on that conversation. Our prereflective unconscious already sorts out the world for us and attaches meanings to it. It is this prereflectively organized world we experience consciously, not the world itself. This is the essence of epistemological perspectivism.

Importantly, the structures of subjectivity are not formed in isolation. Instead, the development of personal experience "always takes place within an ongoing intersubjective system" (Stolorow and Atwood 1992, p. 22). "These principles, often unconscious, are the emotional conclusions a person has drawn from lifelong experience of the emotional environment, especially the complex mutual connections with early caregivers" (Orange et al. 1997, p. 7). The subject's affect-laden social interaction is of utmost importance in the formation and continuous reformation of her world horizon. Thus the subject's earlier experiences largely determine what interpretations are possible for her in her future experiences; how she can understand them and what they mean to her. This explains the importance of childhood as the forming time of basic interpretive patterns. A growing body of research in child development shows how "recurring patterns of intersubjective transaction within the developmental system result in the establishment of invariant principles that unconsciously organize the child's subsequent experiences"

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of their mainly unconscious nature. The name is meant to highlight a contrast with Freud's view of unconscious, which is significantly different. While Freud's view exposed that Descartes' self-conscious cogito was "a grandiose illusion", the Freudian unconscious was still "deeply saturated with the very Cartesianism to which it posed a challenge" (Stolorow et al. 2002, pp. 39–40; see also Cavell 1993). For a throughout discussion of the fundamental difference between Freud's unconscious and Stolorow et al.'s prereflective unconscious, see Stolorow et al. 2002, pp. 39–65.

(Stolorow and Atwood 1992, p. 24)[6]. The structures of subjectivity crystallize "within the evolving interplay between the subjective worlds of child and caregiver" (Stolorow and Atwood 1992, p. 30).

In other words, the way our prereflective unconscious organizes the world for us is largely influenced by our affective experiences with our social environment. The child learns what kind of affects and meanings to attach to what kind of objects through her interaction with parents and other significant others. The child is immersed in the intersubjective system involving her and her significant others and it is inside this system that she learns to respond to her environment in a meaningful way. Our way of interpreting the world – the way we see it – is largely the result of our social interaction.

The motivational primacy of affectivity is another essential feature of the intersubjective systems theory (Stolorow 2002, p. 678; Socarides and Stolorow 1984/1985). This derives from the theoretical shift to contextualism and is part of a larger ongoing transition from drive to affectivity as the central motivational construct inside psychoanalysis, as exemplified in the works of Basch (1984), Demos and Kaplan (1986) and Jones (1995). Affects are subjective emotional experiences and they are "from birth onward regulated, or misregulated, within ongoing relational systems." (Stolorow 2004, p. 551). Recent research has gone a long way to demonstrate that affectivity is not a product of isolated intrapsychic mechanisms; it is a property of the child-caregiver system of mutual regulation (Stolorow and Atwood 1992, p. 26; Sander 1985; Rogawski 1987; Demos 1988). Stolorow and Atwood (1992, p. 26) quote Lichtenberg (1989, p. 2) who says: "motivations arise solely from *lived experience*" and "the vitality of the motivational experience will depend ... on the manner in which affect-laden exchanges unfold between infants and their caregivers". To put it plainly, affects are the central motivational force inside us humans. Furthermore, these affects are formed in our interaction with other human beings.

This background gives us a new understanding of human interaction. The key feature of Stolorow et al.'s approach is to emphasize that the interplay of subjective worlds of experience is not restricted only to childhood but continues throughout the subject's whole life. The main thesis of the intersubjective systems theory is that therapeutic interaction – as well as any direct interaction between human beings – always takes place inside an *intersubjective field*[7]. An intersubjective field is defined as "a system composed of differently organized, interacting subjective worlds" (Stolorow et al. 1987, p. ix). It refers to the "relational contexts in which all experience, at whatever developmental level, linguistic or prelinguistic, shared

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[6]The references here include Lichtenberg (1983, 1989), Sander (1985), Stern (1985), Beebe and Lachmann (1988), Emde (1988a, 1988b). As Stolorow and Atwood (1992, p. 23) themselves put it: "An impressive body of research evidence has been amassed documenting that the developing organization of the child's experience must be seen as a property of the *child-caregiver system of mutual regulation*".

[7]It must be noted that here interaction is used in a more broad sense than is usually comprehended: "The very concept of interaction needs redefinition as only one aspect of the development of emerging, organizing, and reorganizing psychological worlds" (Stolorow et al. 2002, p. 33). The influence people have on each other goes beyond what we normally understand as direct interaction and in this context interaction has to be understood in this wider sense.

or solitary, takes form" (Stolorow et al. 2002, p. 85)[8]. The experiential worlds have to be recognized as being "exquisitely context-sensitive and context-dependent" (Stolorow et al. 2002, p. 96). The essentially social nature of our subjective horizons ensures that a social situation involves "intersubjective reciprocity of mutual influence" (Stolorow and Atwood 1992, p. 4). Experiential worlds are "fluid and ever-shifting", they are products both of the person's unique intersubjective history and of "what is or is not allowed to be known within the intersubjective fields that constitute his or her current living." (Stolorow et al. 2002, p. 47). Experiential worlds and intersubjective fields are seen as "equiprimordial, mutually constituting one another in circular fashion" (Stolorow et al. 2002, p. 96).

This view of a social interaction is essentially a systems view. The interplay in a social system has to be seen as a dynamic, ever-changing process and amounts to "an ongoing intersubjective system" (Stolorow and Atwood 1992, p. 22). Drawing from the dynamic systems theory of Thelen and Smith (1994), Stolorow et al. view a social system as the interplay of self-organizing systems (subjects) in a process that can be characterized as being messy, fluid, nonlinear, multidimensional, and context-dependent (Stolorow 1997, p. 341). "A dynamic systems account of a developmental process, whether occurring during childhood or in the psychoanalytic situation rejects teleological conceptions of preordained end-states and preprogrammed epigenetic schemas. Instead structure or pattern is seen to be *emergent* from 'the self-organizing processes of continuously active living systems' " (Orange et al. 1997, p. 75; inner quote from Thelen and Smith 1994, p. 44) Thus the systems view provides "a broad philosophical and scientific net in which all the variants of contextualism in psychoanalysis can find a home" (Orange et al. 1997, p. 75). The concept of an intersubjective system "brings to focus *both* the individual's world of inner experience *and* its embeddedness with other such worlds in a continual flow of reciprocal mutual influence." (Stolorow and Atwood 1992, p. 18).

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To summarize, in a social situation the interplay of participants' particular subjective worlds influences the intersubjective system, which in turn influences the way the participants view the situation. A social situation always takes place inside an intersubjective system which is constituted by the ongoing process of mutual interplay of subjective worlds. The resulting change of perspective on human interaction is visualized in figure 12.1 on the following page.

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[8]Remarkably, this intersubjectivity of experience is more fundamental than the experience of subjective autonomy. Developmentally, only participation in an intersubjective field creates a subject that is capable of thinking of herself as an independent unit.

(a) Traditional Cartesian view   (b) Intersubjective systems view
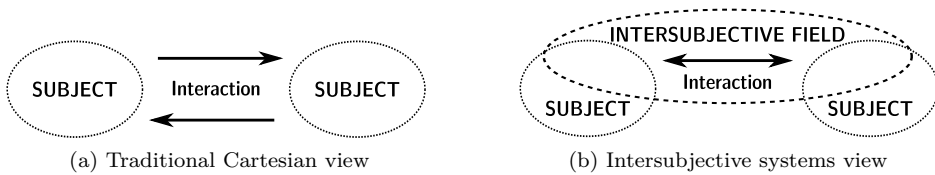
Figure 12.1: Two perspectives on human interaction.

Key Insights from Intersubjective Systems Theory

The framework of the intersubjective systems theory shows the therapeutic situation in a new light. From our perspective the intersubjective systems theory is also fundamentally illuminating outside the therapeutic context. It strikes "very much to the core of what we approach as Systems Intelligence" (Hämäläinen and Saarinen 2007c, p. 298). IST gives powerful rationale for the contextually sensitive and non-objectual approach that is at the heart of systems intelligence.

Below are six features of the intersubjective systems theory that we propose provide fundamental insight into the revaluation of social encounters and human interaction. We see them as formulating an essential comprehension of the intersubjective context in which we human beings act and conduct our lives.

1. We are embedded in systems through and through

Firstly and most importantly, human beings – including therapists – can never step outside their own experiential world or the intersubjective system they are embedded in. Our 'experiential repertoire' or horizon of experience is always partly defined and redefined by the intersubjective system we are currently embedded in. "What you believe is the system, is the system for you" Hämäläinen and Saarinen (2007a, p. 31) state, and intersubjectivity largely defines what you can believe the system to be. No longer can the analyst simply be seen as facilitating or manipulating the process of a psychoanalytic situation from the outside. Instead the analyst and the patient form an indissoluble intersubjective system, in which the analyst's own subjective experiential world plays a crucial part. The impact of the analyst has to be seen "from a perspective *within* rather than outside the patient's subjective frame of reference" (Stolorow and Atwood 1992, p. 93). In the same manner in any human interaction we have to see ourselves as not standing outside the system but being immersed into it. As we meet another human being, an intersubjective system emerges between us and that system has an immense if largely overlooked effect on our thinking, behavior and on how we conceive the situation.

The intersubjective systems theory thus breaks free from the assumption that the encounter between two human beings could be viewed from an objective God's-eye perspective. The analyst as well as the patient are interwoven in the intersubjective system and operate always from a *within*-perspective rather

than from any external or objective perspective[9]. This *within*-perspective of the therapeutic situation "presumes neither that the analyst's subjective reality is more true than the patient's nor that the analyst can directly know the subjective reality of the patient; the analyst can only approximate the patient's subjective reality from within the particularized and delimited horizons of the analyst's own perspective" (Stolorow et al. 2002, p. 103). There is no "objective reality that is known by the analyst and distorted by the patient" (Stolorow and Atwood 1992, p. 91). The analyst is not the possessor of 'right' information about the situation as all psychoanalytic understanding has to be seen as hermeneutic, perspectival, and thus fallible (Stolorow 2004, p. 553).

What holds true for analysts – who are usually much more reflectively aware of their own participation in the system compared to laypeople – holds even more true for other human beings. "Once apparently fixed, systems generate a feeling of being overwhelming and in charge, extending their power to a vast array of microbehaviours" (Hämäläinen and Saarinen 2007a, p. 15). Therefore we should be more aware of our own participation in the system and influence upon it (Stolorow et al. 2002, p. 35). We are trapped inside the intersubjective system and should recognize the limiting effect it has on our understanding of the situation and the possibilities for action open in it.

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Awareness of our embeddedness inside the intersubjective system and our own participation in the process of creating it is thus the first key contribution of the intersubjective systems theory. The lack of an objective perspective on the interaction shifts the focus to the subjective understanding of it. We have to be sensitive to the unique intersubjective system in which we have to operate. "Thinking contextually means ongoing sensitivity and relentless attention to a multiplicity of contexts – developmental, relational, gender-related, cultural, and so on" (Stolorow et al. 2002, p. 84). Because our understanding of the situation is always partial and subjectively biased, we have to be constantly aware of our own limitations and remain flexible in our thinking in order to allow new perspectives on the situation to emerge and to manifest themselves.

2. Shift from a cognitive perspective to an affective perspective

The intersubjective systems theory also demands that the affective nature of any social encounter should not be ignored but instead it should be addressed and utilized. In therapy, the therapeutic impact of the analyst's interpretations lies "not only in the insights they convey but also in the extent to which they demonstrate the analyst's attunement to the patient's affective states" (Stolorow 1997, p. 343).

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[9]See Shotter (2006) for an intriguing discussion about thinking-from-within in another context.

Stolorow (1997, p. 343) states as his belief "that once the psychoanalytic situation is recognized as an intersubjective system, the dichotomy between insight through interpretation and affective bonding with the analyst is revealed to be a false one." Affect and cognition are seen as indissolubly united in lived experience, and their separation from one another is conceived to be a remnant of the Cartesian dualism.

A major asset of the analyst is the *intersubjective clinical sensitivity* that requires the empathic connection, 'undergoing the situation' (Gadamer 1991) with the other (Stolorow et al. 2002, p. 118). The analyst's interpretation of the situation is not a neutral tool but has already an affective impact on the intersubjective system between the analyst and the patient. "A good (that is, a mutative) interpretation is a relational process, a central constituent of which is the patient's experience of having his or her feelings understood" (Stolorow et al. 2002, p. 15; see also Stolorow et al. 1978). All actions of the analyst – also the seemingly neutral ones – contribute to the affective nature of the system and thus create new options and fresh openings that are possible in that particular therapeutic situation.

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The same holds true in any encounter between human beings. For example in organizational settings we easily tend to focus on the cognitive aspects of our interaction; what we actually say or do. In so doing we overlook the rich affective currencies that are always at play under the seemingly neutral surface level and that are potentially highly useful. An affective revolution within the field of organizational behavior is called for (Barsade et al. 2003). As Hämäläinen and Saarinen emphasize, successful leadership is often more about *how* you say something than about *what* you say. Adopting a systems intelligence perspective to leadership means taking seriously the "human dimension" – the subjective human life, with its immensely rich world of emotions, inner subtleties and relations-sensibilities – and giving them top priority instead of focusing only to cognitive and measurable parameters of an organization (Hämäläinen and Saarinen 2007a, pp. 20–21). Whatever the context, the affective dimension of any human interaction should be given the emphasis that it truly deserves.

3. Shift of focus to an *empathic-introspective inquiry*

Stolorow et al. (2002, p. 106) state that "we analysts also seem to participate in a common human propensity to see one's own perspective as the measure of truth and rather automatically to judge those with whom we disagree as unrealistic and misguided." But given the non-existence of an objective perspective we should not be so eager to evaluate, classify or judge the other. Instead, our emphasis should always be on understanding the other. In therapeutic systems this means that "the foundations of a therapeutic alliance are established by the analyst's commitment to seek consistently to comprehend the meaning of the patient's

expressions" and her affect states from a perspective within the intersubjective system (Stolorow and Atwood 1992, p. 93). Analyst should not ask what is wrong with the patient but rather what her personal world is like (Stolorow et al. 2002, p. 38). Stolorow et al. call this the 'sustained empathic-introspective inquiry'. It is our view that this is a perspective that should be widely acknowledged. Arguably it is a key to flourishing social encounters (see for example Isaacs 1999 and Senge's (1994, p. 198) distinction between inquiry versus advocacy mode for a parallel developments).

In sustained empathic inquiry, understanding another person is not a product of entering that person's mind, cataloging its mental furniture (like ideas, affects and fantasies) and writing a case report. "Rather, in the only conception of 'empathic immersion' that makes sense in post-Cartesian thinking, the participants in the conversation (two or more) immerse themselves in the interplay of personal worlds of experience" (Stolorow et al. 2002, p. 37). Stolorow et al. see that this open attitude to the other is not only a consequence of certain theoretical commitments but more the result of general human skills: "The tendency to open rather than to foreclose conversation about meanings may be the most reliable marker of world-oriented psychoanalytic thinking, no matter what the clinician's original training" (Stolorow et al. 2002, p. 36). The central figure of philosophical hermeneutics, Hans-Georg Gadamer, eloquently captures this idea of what true understanding of another human being requires: "The person with understanding does not know and judge as one who stands apart and unaffected; but rather, as one united by a specific bond with the other, he thinks with the other and undergoes the situation with him" (Gadamer 1991, p. 288, quoted in Orange et al. 1997, p. 27).

When we meet other human beings, we should always seek to understand them on their own terms; see the world through their eyes, rather than categorize them using our own pre-existing categories. Giving up on our own perspective and immersing us for the moment into the perspective of another is a prerequisite for really starting to understand one another. Understanding is a process where also our own perspective evolves – a key point Gadamer emphasizes (in for example Gadamer 1994, pp. 44–46). It is only through this kind of striving that a true understanding of the other can emerge. And it is only through mutual understanding of each other that the social encounter can begin to flourish and create positive spirals and "deviation-amplifying loops" (Lindsley et al. 1995).

4. A process view on the intersubjective system

Stolorow et al. view the psychoanalytic encounter from a process viewpoint where all influencing is embedded in the mutually constituted process that is the intersubjective system. "Clinically, we find ourselves, our patients, and our psychoanalytic work always embedded in constitutive *process*." (Stolorow et al. 2002, p. 83). This perspective on the process is equally valid for any kind of encounter between human beings.

A social encounter is a process where the participants, the intersubjective system and the participants' understanding of the system are constantly evolving in an interrelated manner. The change in the intersubjective system or in the participant's subjective world is co-constituted. It is not the result of one-sided

or ping-pong-like turn-taking interventions. "Central to the process of transformation is the understanding of the ways in which the patient's experience of the analytic dialogue is *codetermined* throughout by the organizing activities of *both* participants. The patient's unconscious structuring activity is discernible in the distinctively personal *meanings* that the analyst's activities – and especially his interpretive activity – repeatedly and invariantly come to acquire for the patient." (Stolorow and Atwood 1992, p. 96.) The potential change always happens 'from within' the process.

The process view also opposes any snapshot views of the social encounter. Emphasizing the temporal perspective, it "affirms the emotional life of people who have come from somewhere and are going somewhere" (Stolorow et al. 2002, p. 83). The present moment cannot be isolated from the historical-developmental and cross-sectional contexts or dimensions. Thus serious attention to their interpretation must be accorded (Stolorow et al. 2002, p. 83). An ongoing sensitivity for the developmental, relational, gender-related, cultural and other relevant context factors is therefore called for (Orange et al. 1997, p. 78).

In a social system we are therefore participating in a complex and multidimensional, ever-evolving process. Through the participants' subjective worlds and mental patterns their whole history and possible futures have a role in this process as well.

5. Positive change through the expansion of subjective worlds

In Stolorow and Atwood's view, successful psychoanalytic treatment "does not produce therapeutic change by altering or eliminating the patient's invariant organizing principles. Rather, through new relational experiences with the analyst in concert with enhancements of the patient's capacity for reflective self-awareness, it facilitates the establishment and consolidation of alternative principles and thereby enlarges the patient's experiential repertoire" (Stolorow and Atwood 1992, p. 25).

The crucial source of change is therefore the expansion of the horizon of *both* the patient *and* the analyst. Expanding the analyst's theoretical horizons is important because it "will have a salutary impact on therapeutic outcome, to the degree that such expansion enhances the analyst's capacity to grasp features of the patient's experiential world hitherto obscured" (Stolorow et al. 2002, p. 65). Still more importantly, expanding the patient's experiential horizon is one of the central aims of psychoanalysis according to Stolorow et al. (2002, p. 46). The patients' problems are to a large degree the result of limiting world horizons, of disclosure and hiddenness (Stolorow et al. 2002, pp. 49–50). By expanding the patients' experiential horizons the analyst opens up the "possibility of an enriched, more complex, and more flexible emotional life" (Stolorow et al. 2002, p. 46). The process of expanding the patient's experiential world is thus a central feature in a systems view of therapeutic change.

There is a lesson to be learned from this also outside the therapeutic settings. As a rule, the expansion of the subjective world is something we all should aim at in our everyday encounters with other human beings in order to enrich those encounters. All of them involve unique subjective worlds and through the

process of empathic-introspective inquiry described earlier we can expand our own subjective understanding of the world by trying to accommodate these different perspectives. An enriched, more complex, and more flexible emotional life is a goal worth striving for. This applies to everyone, not just people in therapy.

6. Influencing human systems is a matter of practical wisdom rather than a matter of a right technique

In addition to these general insights, Stolorow et al. have many groundbreaking ideas that concern therapeutic practice. Of these the most important is a critique of the psychoanalytic practice seen as a technique. According to Orange et al. (1997, p. 19) Freud and his followers have misunderstood psychoanalytic practice to be an exact science and a technique. Underlying both of these mistakes is the mistaken assumption that all relevant variables can be controlled. Instead Orange et al. (1997, p. 19) hold that "the realm of the mental is thoroughly incomplete, indefinite, and open." Therefore making successful interventions to a human system is rarely a matter of applying a predetermined technique. Instead the uniqueness of every human system implies that the best way to succeed in these complex systems is to apply the *practical wisdom* you have acquired through previous social encounters.

The problem with relying too much on a technique is the fact that the "primary purpose of the rules of any technique is to induce compliance, to reduce the influence of individual subjectivity on the task at hand" (Orange et al. 1997, p. 23). Given the particularity and uniqueness of every social encounter this unnecessarily limits the space of possibilities available to the agent. Techniques can aid us in focusing on the right approach in a social encounter but they should not be pushed too far.

"The realm of the mental is thoroughly incomplete, indefinite, and open" (Orange et al. 1997, p. 19).

In the place of technique-oriented thinking Orange et al. propose that influencing other people and human systems should be viewed as a kind of *phronesis* or practical wisdom in the Aristotelian sense (Orange et al. 1997, p. 27). Practice – and not technique – "is characteristic of work with human beings with minds" (Orange et al. 1997, p. 27). In Aristotelian practical reasoning it is impossible to know in advance the right means to any end. The ends and goals emerge only in the 'acting situation'. (Orange et al. 1997, p. 26.) As social encounters are always unique the general rules only tend to impede the understanding of them (Orange et al. 1997, p. 32).

Freed from the shackles of a limiting technique, analysts are able to grasp the situation in all of its complexities and idiosyncrasies. "We point to the possibility of an emancipation of analysts in both their thinking and their practice, a freeing that would enable them to use the full resources of their creativity in the tasks of psychoanalytic exploration and treatment" (Orange et al. 1997, p. 89; Lindon 1994). The same holds true for anyone who has to work with and influence other human beings. Management and leadership literature is full of various fads promising that through the technique they offer various beneficial

outcomes can be generated. However, too onesided reliance on any one technique is likely to cause more harm than good because of the delimiting effect it has on manager's creativity and practical wisdom (see Mintzberg et al. 1998), or ability to launch a systems intelligent intervention in the sense of Hämäläinen and Saarinen (2007a). Taking seriously the complexity of any human system means giving up the possibility of controlling it fully with any one technique or even a set of techniques. Instead the emphasis should be placed on practical wisdom, on the human ability to act intelligently in situations that are too complex to be covered by any one perspective.

From Intersubjective Systems Theory to Systems Intelligence

Systems intelligence operates on the assumption that social encounters can be meaningfully conceptualized as systems. Only then it makes sense to suppose that we indeed have something called *systems* intelligence that is in operation in our encounters with other human beings.

Here the intersubjective systems theory is illuminating. It provides us a systems understanding of immediate social encounters; a sophisticated theory of how we are deeply embedded in the intersubjective system that is co-constructed every time two or more human beings meet. In so doing it provides a feasible background rationale for systems intelligence. If social encounters are of the complex and embedded kind that Stolorow et al. suggest, it is natural that during the course of human development we would have developed *a skill to cope* with such fundamental systems. Humans are essentially social animals. Before language, reflection or technical rationality they were already embedded in social systems in which they had to operate. As Hämäläinen and Saarinen (2007a, p. 4) put it: "before anything else, there was already action, there was a context, something was already taking place." During our evolutionary history we humans have always been embedded in immediate social systems. Evolutionary success in that kind of social environment requires a keen sensibility for the social system. That is exactly what systems intelligence highlights and aims to conceptualize.

In understanding intersubjective systems theory we therefore come to see the importance of systems intelligence. If the human systems really are as complex and interdependent and if we really are embedded in them in the way that the theory of Stolorow, Atwood and Orange claims, we surely need to rely heavily on something like systems intelligence to cope with our everyday life. Consciously rational and objectifying, verbalized and explicit linear thinking simply does not provide us with tools that enable us to act productively enough in such situations. Hämäläinen and Saarinen (2007b, p. 39) capture the challenge intersubjective systems theory represents to us when they ask: "Suppose the veil of uncertainty is to stay. Suppose you have to act, without knowing what your choices ultimately amount to. Suppose you are in a situation where external forces are at play, influences mover hither and thither, the future is uncertain, and still you have to act." Systems intelligence perspective describes the intelligence we naturally have and which allows us to act in the epistemically opaque complex social systems we

are continuously embedded in. Systems intelligence is about engaging successfully and productively within the social systems as they emerge (Hämäläinen and Saarinen 2006, p. 191). It is a form of intelligence we must have in order to survive and succeed in our everyday life which is deeply embedded in a multitude of different intersubjective systems.

Central to intersubjective systems theory is the idea of a prereflective unconscious that delivers the world to us loaded with meanings. Systems intelligence taps this realm. For instance, prereflective unconscious is what gives us the 'feel' of a situation, feeding our systems intelligence vis-à-vis that situation. Entering a room where a group of people is chatting we immediately get a feeling of the mood of the social situation unfolding there. Here prereflective unconscious is at operation and serving our systems intelligence skills. Immediately immersing itself in the intersubjective system of a social situation the prereflective unconscious is able to grasp the intersubjective currents at play in all their nuances. Thus it is able to give us preverbal and prerational 'knowledge' or rather know-how of the situation. Without us acknowledging it, certain systemic possibilities open themselves up to our conscious consideration and certain others are closed. Outside our awareness the prereflective unconscious tunes in to the mood of the social system thus deciding what modes of being are appropriate in this particular intersubjective system. I hear a hilarious joke in a party and in an uplifting mood enter another room to tell it to my girlfriend and her friends. Immediately at the doorstep, however, the serious look on their faces tell me that it is not a time for joke. In a twinkle – and without making a conscious decision about it – my mood changes to a more serious and inquiring one to better respond to the intersubjective system I just immersed myself into. I may have already forgotten the joke I was so eager to tell only a second before. Being sensitive to this instinctual awareness of the situation and utilizing the gained know-how in our practical decision-making is systems intelligence. It is "intelligence-as-embedded-in-action and with respect to the situation, context, environment, locality" (Hämäläinen and Saarinen 2007a, p. 40).

Systems intelligence puts the emphasis on what we already do right and what we could do more of in the systemic settings (Hämäläinen and Saarinen 2006, p. 192). Having a lifelong experience of these intersubjective systems we all are armed with a keen sensibility of what kind of behavior might be appropriate in any given situation, a sort of *procedural* knowledge (see Fosshage 2005). In other words, we are in fact already operating with systems intelligence. We are out there forming the various human relations with the systemic situation at hand. Inside psychoanalytic tradition, Wilma Bucci (1997, p. 158) captures this dimension beautifully when she writes that "the analyst perceives and responds to his patient on multiple, continuous dimensions, including some that are not explicitly identified. The analyst is able to make fine distinctions among a patient's states . . . without being able to express those feelings in words." In other words, the analyst does have an ability to sense and experience the subtleties of the system at hand. Similarly, following the affective and preverbal instincts – gut feelings, if you wish – our actions are often intelligently facilitating the system into the right direction without us necessarily being fully aware of these actions or their rationale. The idea of systems intelligence is "to connect more actively,

sensitively and lively" with this competence we already possess (Hämäläinen and Saarinen 2007a, p. 23).

Systems intelligence thus complements intersubjective systems theory in connecting its vital new perspective on social encounters with a theory of how to act in them. But IST returns the compliment by enhancing our systems intelligence. Intersubjective systems theory is best understood as being a metatheory, a conceptually empowering sensibility that informs our thinking and acting in social situations (Orange et al. 1997, p. 88). Instead of giving us ready-made techniques to use in our day-to-day interaction with fellow human beings it merely teaches us to look at our immediate social environment with open and creative eyes. In this context systems intelligence can be seen as an attitude that adopts the IST perspective and focuses on the potential it has for acting more intelligently in the social encounters of our everyday life. It complements IST by showing how we have an ability to sense our way in these complex social systems and urges us to ride on this capacity. At the same time the perspective of IST makes us more aware of the systemic nature of our

Immediately immersing itself in the intersubjective system of a social situation the prereflective unconscious is able to grasp the intersubjective currents at play in all their nuances. Thus it is able to give us preverbal and prerational 'knowledge' or rather know-how of the situation.

social environment. We become more sensitive to the subtleties of any particular system and therefore can sense more pathways to positive outcomes in that system. By looking at the world through the glasses of IST we are more sensitive to the systemic potentials inherent in the situation and therefore more able to act with greater systems intelligence.

Conclusion

Systems intelligence is about the ability to act intelligently in systems we are embedded in. Of focal importance is here the system which we all encounter everyday – that between two or more human beings. To understand what kind of system this is, we need a theory of the human system. As we see it, intersubjective systems theory provides key steps to that effect. It presents a remarkably apt background theory for the systems intelligence approach. As a result, the two frameworks become connected in at least two important ways: systems intelligence is able to provide IST with a theory of how to act in intersubjective social situations, while adopting Intersubjective Systems Theory makes us more aware of the subtleties of the context and thus open possibilities for us to become more systems intelligent.

One particularly valuable aspect of the intersubjective systems theory is its perspectivism; the view that all human thought involves interpretation. Our understanding is always limited by our own horizon of understanding. A neutral point of view simply does not exist for human beings; we experience the world as

interpreted by our subjectivity and by our prereflective unconsciousness. Next piece in the puzzle is intersubjectivity: psychological phenomena should not be understood as products of isolated mechanisms inside individual minds, but as emerging from the interface of reciprocally interacting subjectivities. Psychological phenomena can only be understood as part of the intersubjective contexts in which they take form.

Combining perspectivism and intersubjectivity leads to a systems view on immediate social encounters. All human interaction takes place inside an intersubjective system which is constituted by the ongoing process of mutual interplay of subjective worlds. This recognition of social encounter "as a dyadic intersubjective system of reciprocal mutual influence, to which the organizing activities of both participants make ongoing, codetermining contributions" (Orange et al. 1997, p. 43) is truly revolutionary for any implicitly Cartesian framework. Among other things, it addresses seriously the affect-laden nature of human interaction, its reciprocity, complexity and intersubjectivity. It enables us to see a social encounter as a mutually created and unfolding system that to a large extent operates outside of our cognitive-rational awareness. The intersubjective systems theory thus highlights the importance of our sensibilities and our multi-faceted endowment that enables us to live out the subtle, contextual and crucially important aspects of the social encounter. Adopting the intersubjective systems perspective on social situations we encounter makes us responsive to the subtle aspects of situations, and thus paves the way to acting with greater systems intelligence in those situations.

All human interaction takes place inside an intersubjective system which is constituted by the ongoing process of mutual interplay of subjective worlds.

On the other hand, understanding social encounters through intersubjective systems theory paves the way for understanding the paramount importance of systems intelligence in our everyday life. Systems intelligence as the ability to move ahead with sensitivity and on-the-fly adaptability vis-à-vis the system that is emerging is centrally important in social environments which are too multidimensional to be captured by the actor's objectival or narrowly rational mind. Central to systems intelligence is the conviction that we already have such an ability and that this ability is not dependent on anybody being able to articulate or formulate what that ability amounts to. When embedded in complex social systems we are endowed with competences to sense the situation beyond words and beyond conscious representations. We feel our way forward. Systems intelligence celebrates this capacity and encourages us to foster it more, as does in its own way the intersubjective systems theory[10].

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Name Index

Subject Index

The systems intelligence approach seeks a broadband effect across disciplines. It amounts to an extension of systems thinking and other objectivistic modes of thinking. It recognises the significance of the sensitivities-based, "soft", subjectivistic and first-person -related aspects of the human endowment as fundamental to the human systemic engagement with her environment.

While rationalistic traditions of thought have often overlooked the significance of the realm of subjective sensibilities, the systems intelligence approach seeks to make use of them. It amounts to an art of life that combines the subjective and the objective in real time and in the midst of evolving processes and actions. When facing the gulf that separates the natural science and mathematics inspired objectivism from the humanities and the arts inspired approaches to human affairs, systems intelligence chooses integrity.

In the current volume the systems intelligence perspective is brought to illuminate such phenomena as philosophy for managers, David Bohm's theory of thought, emotions and decisions, the sociological affect control theory, Alexander's view on architecture, homiletics, food, the professional growth of a European champion figure skater, usability, infant research, facilitation mastery, and the intersubjective systems theory of Stolorow, Atwood and Orange.

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