

# Feeling and Meaning: A Unified Framework

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## Aims and Objectives

The discussion which follows is a synthesis of about three years' exploration of potentially more useful ways of looking at the relationships between meaning and feeling. It aims to be more useful than most of what I have found in the literature on the psychology of emotion, and more useful specifically for the purpose of analyzing rich media records of situated human activity.

I will argue that feeling and meaning are two aspects of the same material processes, that the dynamical system in which these processes occur is always larger than what we think of as an individual human organism, that meaning and feeling as processes both always occur across multiple timescales and scales of organization in complex open dynamical systems and have their origins in systems that may be simpler than single cells. I will argue that both feeling and meaning as processes are distributed, situated, context-dependent, active, and culture-specific.

I will consider the relations of feeling-and-meaning to movement and the animacy of living systems, to the semantics of language and more general multimodal semiotics, and to their experiential qualia. I have by no means put together a complete, consistent theoretical model of these matters. I do not believe that doing so is either possible or desirable. Given the richness, complexity, messiness, and transcendence of all possible human modes of understanding which are involved, the best we can do is to assemble a toolkit of discourses and practices with which we can do useful bricolage for the purposes at hand. Whatever I say here, more work will always need to be done to make sense of any occasion or trajectory of feeling-and-meaning.

## *Is meaning a kind of feeling? Or is it the other way around?*

What role do those phenomena we variously call emotions, affects, or most generally *feelings* play in the ways we make meaning, the ways we make sense of and with the world and one another? How can we analyze rich media data that documents living activity without slighting either the feelings that incline us to particular actions or the meanings through which we interpret possible actions?

If a synthesis of approaches, heretofore separate, to both meaning (based in semiotics) and to feeling (from the phenomenology of experience) is to be possible, then I believe that a necessary first step is to re-conceptualize feeling along the same lines that we have done in recent decades for meaning.

Meaning is a process, meaning-making, or semiosis. It can no longer be regarded in sophisticated analyses as being in-the-head, or even mental in the old Cartesian sense of belonging to a plane of existence apart from the material. It should rather be recognized as being *distributed*: between organisms and environments, subjects and objects, cooperating persons and mediating artifacts. The material substrate, i.e. the dynamical system in and through which meanings are made, includes what have traditionally been distinguished as “subjects” (with a misconceived monopoly on agency and intentionality), “objects” (wrongly regarded as passive or merely reactive), and “meditational means” (tools, symbolic representations, etc.).

Likewise meaning-making is *situated*, both in the sense of being influenced by the context of situation (setting, participants, affordances of objects), and in the sense of being distributed throughout the situation (indeed in some sense relevance to meaning-making, and to feeling, defines what is or is not part of the “situation”).

It is an *active* process, not specifically in the sense of conscious intention and agency attributed only to humans, but in the sense that it is not simply a reaction to external stimuli: through it situations are changed, actions imagined, possible and probable relevant events anticipated, transfers of energy, matter, and information initiated, evaluations made.

Moreover, its modes of operation are not psychological universals, despite the will of Christian theological universalism and humanist moral universalism to have it so. The specific processes and their deployment vary: across human communities, individuals, situations, and moments. It is *locally specific*, and in common parlance *culturally specific*.

***And so is feeling.*** If we are to bring the analysis of meanings and feelings into productive conjunction, we need to reject older elements of our own cultural tradition according to which feeling, and more specifically what we are taught to call “emotions”, are in-the-head, mentalistic phenomena, purely individual and intra-organismic, passive reactions, and psychologically universal. We need to re-conceptualize feeling as an active process, distributed in a dynamical system that includes ourselves and others and the material elements of the settings and networks of mediating artifacts that make feeling, like meaning, happen as it does in each instance.

*We need to re-conceptualize feeling as distributed, situated, active, material, and locally, including broadly culturally, specific.*

It may help to recognize the long Western cultural and philosophical animus against feeling, specifically against “emotion”, and the false opposition thereby created between “emotion” and “reason”, praising the latter and warning that Emotion is Reason’s enemy, distorting, biasing and undermining it. We should recognize at the same time that this has always also been a political animus, denigrating women, serfs, workers, children, and the peoples of Africa, Latin

America, Asia, and even those of southern Europe, as too prone to the effects of emotion and therefore unable to govern themselves properly according to Reason.

I will generally use the term *feeling* rather than either *emotion* or the more fashionable *affect*, both to distance my discussion from these old prejudices, and to ground an approach to the “higher affects” (pride, sense of nobility, playfulness, reverence, etc.) and the classic emotions (love, hate, anger, fear, ...) in more general, proprioceptive and animating processes (e.g. feelings of drowsiness or alertness, calm or frenzy). I do so in parallel with the broad usage of *meaning* to cover everything from attentional focus or salience to evaluations and interpretations.

I hope it is clear that I am also taking both meaning and feeling processes to be “embodied” – just not embodied solely within the limits of single human organisms, though obviously, for us experientially, they are both very significantly dependent on perceptual and motor processes, on neurological and biochemical processes that do occur in some sense “within” us, though never, I think, insofar as they are relevant to meaning and feeling, without necessary connections to our interactions in and with a larger material environment.

Indeed, the perspective being offered here requires us to re-think what we mean by organism and environment, in biological terms, and especially what we mean by person and environment, in meaning-and-feeling terms. I will discuss this in more detail below, but enough for now to recall von Uexkull’s (1928, 1982) notions of *Umwelt* and its less-well-known partners (*Wirkwelt* and *Merkwelt*). In brief, the organism interacts with its material environments in ways that make some of their physical features more or less salient as elements relevant to particular processes, and more broadly, the basis on which any boundary is drawn between inside and outside, me and it/you, changes from species to species, organism to organism, and event to event. We are originally and always integral parts of larger ecological (including sociocultural) wholes, and our separability as individual persons or organisms is a very locally specific and variable construction. While I will refine this initial description later (see discussion of the 3-level Model below), for now we shall put wholes before parts, asking always what happens within wholes to differentiate out the parts.

Let me conclude this section by returning briefly to the initial question: if we re-conceptualize feeling to bring it more in line with newer understandings of meaning, then what sort of relationship between the two are we aiming at?

We could for example try to reframe feeling as a specific kind of meaning. This is done quite naturally in studies of the meaning of feelings, for example in analyses of the semantics of feeling terms in natural languages (Bednarek, 2008; Martin & White, 2005). It could also characterize the somewhat imperialistic efforts of the field of cognitive psychology to theorize emotions solely as evaluations, and thus as a specific variety of meaning-making (Frijda, 2004; Lazarus & Lazarus, 1994). There is, I believe, a certain usefulness in trying to understand what kinds of meaning-making are most convergent with active

feeling processes. We can use the tools of linguistic semantics and more generally of multimodal semiotics to characterize the meanings that accompany, inform, call forth, modulate, interpret, and evaluate feelings.

On the other hand, we could try to reframe meaning as a kind of feeling, to ground the meaning-making process in what might seem to be phylogenetically earlier feeling processes, and to in fact imagine that bodily feelings were the first signifiers, prior to words, to gestures, and indeed to humans. I believe that this is also a useful exercise. But it happens not to be the case that feelings are phylogenetically prior. Semiosis is as old as life itself, if not older. And so are feelings. Not perhaps in the sense of experienced qualia, which require a relatively high degree of system complexity, but at least in the sense of consequential indices of system and subsystem conditions. In fact, it is in these simplest possible systems which can do both semiosis and aesthesis (i.e. feeling) that we find the very same processes functioning as both.

And so, I believe, is it likewise the case in all more complex systems: it is the same material dynamical processes that do both meaning and feeling, though the extended networks of inter-mediating sub-processes and their participant bits of matter get larger, longer, slower, and more complicated as we approach the case of people-in-settings, and perhaps go beyond it.

### ***Pointers to the Literature***

I am trying in this discussion to keep citations to a minimum. The literature on these topics is vast, and it is not my purpose to engage with it directly. Instead, I will from time to time insert a short section of references to particular, representative works that can serve to guide interested readers further, including references to my own work.

So, for current views of meaning-making (often under the heading of cognition, or semiosis) as: distributed (Hutchins, 1995), situated (Lave, 1988; Lave & Wenger, 1992), material and semiotic (Hoffmeyer, 2008; Lemke, 2000b), culture-specific (Halliday, 1978; Lucy, 1992a, 1992b). For culture-specific emotions, see (Lutz, 1995) and broadly on the historical bias against the passions, see (Noble, 1992).

### ***Origins and Fundamentals: Feeling***

There is a certain rhetorical awkwardness in my project. Ultimately, I want to maintain that meaning and feeling are a single process. At best, it can be useful to think of them as two complementary and mutually informing aspects of a single process. But we all begin with rather different ideas about what each of them is, and so for a time I will need to discuss them separately in order to connect with our separate initial ideas about them.

Let me begin with feeling, then, because the view of it I am offering here is more radically divergent from common opinion, though 20 years ago I think my view of meaning would have been regarded as equally strange in some respects.

Let's start with a little naïve phenomenology. Most of the time, we are not in the grip of strong, named emotions. We are not feeling angry or frightened. We may be feeling energetic or lazy, alert or tired, hungry or restless. For all these feelings, we recognize that they have some sort of onset, perhaps unnoticed at the time, some sense of duration-till-now, some degree of, perhaps variable, intensity. We always feel somewhere on the cline between elated and depressed, hopeful and despairing, energetic and fatigued, hungry and sated. And most often somewhere in the unmarked middle range, call it Satisfactory, or call it nothing. No warning bells, no special conditions. But even this middle state is a distinct feeling, as we know from its absence or replacement by something more unusual.

We are taught to think of these feeling-conditions as conditions of our Selves or of our Bodies. But in fact they are always indices of the condition of us-in-the-world, of our actual and potential interactions with what we think of as our environment: other people, things, circumstances, places. We inherit the Cartesian error of thinking of our Minds or Selves as separate from our Bodies, as Descartes himself inherited it from centuries of Christian theology separating the Soul from the Body, the realm of Spirit from that of Matter. We do not sit inside our own bodies looking out. We *are* our bodies, actively scanning and looking *for*, looking around, reacting to visual impressions, anticipating them, comparing expectation to current impressions, etc. And of course we are a great deal more: all the rest that our bodies are doing in the process of being and staying alive, much of which is some sort of interaction with, action upon, or anticipation and imagination of what is happening "outside" us.

Physics and biology tell us not to take the notion of the isolated organism too seriously. Even while law, commerce, and religion want us to take the notion of our individual personhood, soul, and moral-legal-financial responsibility very seriously. But living organisms are dynamic, open systems: they exist only by virtue of their (our) transactions with the environment, only by continuously exchanging matter (air, food, waste), energy (heat, nutrition), and information (perception, action, language) with other elements of the larger ecological and social systems to which we belong. Interrupt any of these for a short time and we rapidly become less human, less healthy, and finally much less (indeed not at all) alive.

What we are is the product of what we are doing now, and what we have done in the past that leaves its traces. But much of that is not "our" doing, but what has been done to us, has happened to us, has happened in fact in our interaction with the environment, each affecting the other, until it becomes impossible to say what came only from the doing of the organism and what came only from the doing of the environment. In developmental biology, each organism begins as an integral part of some other organism (for us, a mother), which is itself already tightly integrated into larger units (a family, a community, a culture or society),

and we gradually become more specialized and differentiated as a part of the mother-ecology system. Our initial cellular being at fertilization is primarily a cell of the mother (the egg, ovum), with a tiny contribution of part of our father's biochemical recipe book (his DNA), which the ovum adds to its own inherited recipes, all of which it proceeds to make use of as needed, as it continues its own destiny in the maternal "germ line".

Even after birth, the newborn is totally dependent on the mother, is for most purposes really still a part of the mother biologically. Even after a long period of tissue separation and separate experiencing, mother and child have an intense bond, marked by their mutual separation anxieties. And they have been sharing nutrition and immune systems, not to mention physical contact, mutual responsiveness, etc. before birth and since. The child also gradually inherits the mother's family, community, places, language, and culture as it comes to interact with these in ways that very gradually become less totally intermediated by the mother. So the child comes to have its own unique integration, still as a part, into the same larger whole as the mother.

I am presenting this picture of organisms as units within larger wholes because it is essential to understanding that feelings monitor not simply the organism as a somewhat artificially separable unit, but the status of the organism-in-environment system. They monitor relations and interactions, actual and potential, and as part of that function, of course, they also monitor some aspects that we can think of as more "internal".

But why do we have such feelings? What are their actual and evolutionary (i.e. past, ancestral), adaptive functions? If we feel tired, why does that matter? It matters because it is a relevant aspect of our stance to the environment, our readiness to respond to danger or opportunity in and from the environment. Likewise if we feel nauseous, that too is a feeling about our condition relative to the environment, and perhaps also to what we should be ingesting from it or not.

It has long been accepted that the strong, visceral, named emotions, such as fear and anger, desire and disgust are indicators of whether we should seek out or flee from something in the environment, whether we should attack or run away, swallow or spit out. In these cases even more clearly, feelings are about interactions and relations, they monitor the conditions of us-in-it, and not simply of our imagined "interiors".

In this sense, feelings are most fundamentally signals or indices of part-in-whole relevant conditions. For us humans, in the right "external" circumstances, these signals or indices are "felt" as what philosophers cutely call experiential "qualia". This is what we recognize as the feeling of our feelings, what anger or fear or nausea feels like, to us, on some particular occasion. But a system does not need to have the elaborate neurological-hormonal machinery of a human body to benefit from having and responding to such signals. A single cell certainly has feedback mechanisms, chemical signaling, sensitivity to local and protoplasmic concentrations of various chemicals, and ways of reacting to them, which serve the same function (Hoffmeyer, 2008). And so on up the scale of organismic

complexity throughout the whole kingdom of life, from unicellular to human. The qualia of feelings may differ from species to species, as they do, I believe, from person to person, and even from occasion to occasion. They may even be absent as qualia from the simplest organisms, but not absent as processes with the same functions.

I have so far in this account of feelings neglected somewhat one key aspect. Feelings are not passive, any more than perceptual processes are. We do not simply sit and absorb passing photons, sound waves and chemicals. We actively seek them out, we scan, we anticipate, we actively listen and sniff. The most unique property of living systems is that we are restless. We are constantly interacting with the environment, we are constantly actively doing. We are moving, we are animate (for a brilliant discussion see Sheets-Johnstone, 2009). We generate our feelings actively just as much as the environment provokes them in us as responses. Feelings do not just monitor, they are the products and indexical signs of our interaction with everything around us.

From this account it should already be clear, though we will say more about these points later, that feelings too are distributed (arising in a material system that goes beyond the isolated organism), situated (i.e. specific to the context of setting, place, other persons and things present), active (initiating, interactive), material (processes in and among material systems), and locally and culturally specific (different in detail across species, communities, individuals, cultures, and occasions). It may also seem that feelings are phylogenetically more primitive than meanings, and so cannot really be aspects of the same processes by which we make meanings. But this view underestimates radically the scope of meaning-making, i.e. semiotic processes in material systems. And it is to this complementary topic that I now turn.

### ***Origins and Fundamentals: Meaning***

We have become accustomed to thinking of the term meaning as a noun, a sort of abstract thing. But I try to use it consistently as a verb, an action process, something we do when we mean something. To remind us of this I will for now use the synonym, *meaning-making*, for the (material) process. And meaning-making, in turn, is a less formal term for *semiosis*, provided we keep in mind that here semiosis will always mean the actual dynamical material processes of making meaning, and not simply the abstract phenomenon.

Perhaps the most useful starting point for understanding meaning-making or semiosis is Charles Sanders Peirce's (Peirce, 1998) basic account of it as a sign-process. Semiosis is the process by which something comes to stand for something else to someone (or some thing). Peirce's great contribution was to see semiosis as an inseparable unity of three, rather than two, elements. The more classic view of a sign was simply a relation between a signifier (the thing that stands for something else) and a signified (the something else), a binary relation. And the incoherent theories of representation, and even of truth, that

many people still struggle with today, have never gotten very far past this misleading over-simplification (Bickhard & Terveen, 1996).

To dispense quickly with binarism, what it basically says is that the signifier is a representation of the signified, in one respect or another, and that it is an accurate or truthful representation when the conditions that apply to the one can be translated into those that apply to the other. So, in this view, verbal propositions or claims, are true if they are “in correspondence” with the world, i.e. if they are accurate, faithful, truthful representations of it. This is all nonsense (or as Mark Bickhard more politely puts it, incoherent).

There are a number of unsupportable assumptions in the binary view, beginning, as Peirce noted, with the simple fact that no signifier (he calls this the *representamen*, in his somewhat archaic, but well-defined terminology) ever by itself points to what it is a signifier of, i.e. to its signified (which he calls its *object*). How are we supposed to know what the word “horse” refers to? Or a scribble on a piece of paper? How do we know which “real-world reality” some verbal proposition is supposed to represent or be “in correspondence” with? The signifiers can’t tell us that. We have to interpret some signifier as being a sign of some particular signified or object, or someone else has to tell us how to do this, or do it for us -- even if this means teaching us how to use the English language in some environment (and a lot else besides). In every case of semiosis there must be what I shall call, updating Peirce’s terminology a bit for my purposes, an Interpreting System or *System-of-Interpretance* (hereafter, the S.I.).

The S.I. is the crucial third element, the one that construes (a term from Halliday) a specific kind of relationship (not just “correspondence”; Peirce catalogues a couple dozen specific logical and material relationships) between signifier (representamen) and signified (object). In doing so, the S.I. produces a response, a reaction, an interpretation, a meaning, which Peirce calls the “interpretant”. (In fact there is usually a whole sequence of interpretants, each taking the previous one as another representamen.)

I will not follow Peirce into the details of his scheme for analyzing sign relationships, beyond the basic insight that you always need an interpreter or S.I. to construe some relationship between signifier and signified, and in doing so to in fact connect any signifier (or representation, in usual parlance) to a particular, and quite conventional (or at any rate, S.I.-specific) signified. I will also not say much regarding the epistemological and ontological implications of doing away with a correspondence theory of meaning or truth, except to say that it makes far more sense to build a more interactive model of the relationship between representations and “the world”, in which representations are themselves material things in the world, with which S.I.’s make meanings, and which in turn materially affect the world (and the S.I.). People, representations (texts, images, videos), and other things are intimately interdependent and interconnected in extended networks of heterogeneous relationships (Latour, 1999).



So, what is the simplest material system that can do semiosis? Consideration of this question leads to some further basics for a material model of meaning-making.

How should we distinguish between simple material (Aristotle's "efficient") causation and a semiotically-mediated response by some system? Between a chair that tips over when kicked and a paramecium that swims in the direction of some potential food? What tests can we apply to say that some instance is an example of semiosis or not?

Of course you may not want to start with the paramecium, when what we are asking is how meaning is made. So let's back up and consider more familiar cases of meaning-making, according to a Peircean model – and with a little help from (Bateson, 1972).

As we inter-act in the world we encounter a lot of perceptions, actions, phenomena, doings and happenings, processes and things, places and occasions. For some of them to count for us as signs of others, there has to be some set of associations (our nervous systems seems good at producing these), such that there is not, for us, an equal likelihood that anything can go with (i.e. follow closely in time, or appear nearby in space) anything else. There is not an equal probability or frequency of all possible combinations. There is not total chaos, but for us, there is some degree of order. Mathematically, this means that there is some degree of "redundancy" or informational order: some things are more likely to go with (predict) some other things. Not absolutely, not 100% of the time, but more than by mere chance alone.

These more likely combinations can then be regarded as provisional units on a larger scale, and to them can then be associated still more elements that tend to more often be associated with them. If we then encounter some of these, we tend to expect the others. Our expectations come to be context-dependent. In seeing one thing, we take it as a sign of the whole cluster, or context; or alternatively, having recognized a whole, a context, from some of its signs, we then have a particular set of expectations different from what we would have in some other recognized context.

For any given item that we encounter (thing, happening, whatever), there are various associations it might have, predicting various other items, and *which predicts which* is itself a function of the context. This works both ways, of course: seeing a pattern of associations, we infer a context; and inferring a context, we adjust our expectations. A particular set of associations predicts a context, and vice versa. Indeed a pattern of associations constitutes the context. A part of that pattern gives rise to expectations about a number of possible contexts or situations we may be in, and further experience either narrows this down to a familiar one, or leads us to build up a new one.

In the language of semiotics, these are indexical relations: patterns of associations index contexts (contextual sets), and contexts index the various

elements and associations that constitute them. Symmetric indexical contextualization. We are almost to meaning-making.

There is one more logical step and its material implications. (So far we have been concerned with the logical relationships more than the material ones.) Imagine that we have a system that construes relationships as follows:

<  $A_i / B_j // C_k$  >

meaning, in some context  $C$ , we have a particular set of relations between  $A$ 's and  $B$ 's. I am skipping here the more elementary steps of noting that even the act of identifying *what* an item is depends on the patterns and context in which we find it. And the generalization that the process we have described also suffices to create classes or categories of similar, but contrasting items ( $A_1$  vs.  $A_2$ ,  $B_1$  vs.  $B_2$ ). These are standard semiotic operations (classification, differentiation).

But will every S.I. construe experience in the same way? The same patterns of association of  $A$ 's and  $B$ 's (and whatever else) in the same contexts ( $C$ 's)? No, of course not. There is not one meaning-world for all organisms, or indeed for all individual people. Jakob von Uexkull's famous analysis of the Umwelt of a species argued persuasively that different species "see" the world differently. Not just because they have different sensory organs, but because different aspects of the environment are differentially relevant to them, to their survival, to their reproduction and interactions. Their worlds are different in terms of the Merkwelt, or what is perceptually salient (the "marks" we notice), the Wirkwelt (the action-world, how the world is for us in terms of how we act on it), and most generally the Umwelt (a notion of ecological "niche" that is more fundamentally interactive and less positivistic than the one that is often used).

So we need to extend our diagram a bit more:

<  $A_i / B_j // C_k /// S.I.m$  >

where we now imagine different S.I.'s (labeled by  $m = 1, 2, 3, \dots$ ), each of which construes different situations or contexts, within which it will connect different  $A$ 's and  $B$ 's in different ways. Note that this "construing" is the Peircean semiosis: taking, for instance, an  $A$  as a signifier of a  $B$ , in context  $C$ , for that S.I.

In mathematical or information theory terms,  $A_i/B_j$  means that the set of  $A$ 's and the set of  $B$ 's are mutually redundant (have mutual information); from partial knowledge of one, we can partially predict the other, with better than random chance of success. And  $A_i/B_j//C_k$  means that the context sets  $C_k$  are redundant with the redundancy relations of the  $A$ 's and  $B$ 's! Bateson's called this "meta-redundancy" or redundancy among redundancies. It was my first clue to characterizing meaning-making as selective indexical meta-contextualization.

Yes, that is a mouthful, and very abstract. It is a logical formulation, following Peirce and Bateson, but it is also very specific: selective contextualization means the S.I. connects a particular signifier and a signified (representamen and object),

that it more likely does so in a particular context, and how these combine with one another depends on the particular S.I. In fact, the S.I. is semiotically defined by how it does this. And if we have a lot of S.I.'s, then the particular pattern of connections associated with each may itself constitute a still higher order (meta-meta-redundancy) pattern, which we might call the culture of a community, with its divisions among roles and types of people who make different sorts of sense of their experiences.

Note further that none of this reifies the levels: they are simply a logical hierarchy, a tower of abstractions, from "items" or phenomena, to consistent patterns of associations among them, constituting situations or contexts, to consistent ways of doing this, constituting S.I.'s, to ways of differentiating among S.I.'s according to different ways of making meaning, which I called "cultures" for want of another term. None of this means that S.I.'s have to be people, though they do have to be material systems, or that "cultures" are communities consisting only of people. They are just patterns of practices, of ways of making sense.

But we started out to answer the question of what would be the simplest material system that could do semiosis? That could do selective, indexical, meta-contextualization? And what do we know, then, so far about such a material system?

It has to be capable of distinguishing an A from a B, i.e. it must be able to selectively respond to, or do, different things and processes. But it cannot be locked into a mechanical, 100% predictable, ways of doing this. It has to be able to recognize, classify, and respond differently in different contexts. Note that I mean these only functionally, I don't mean "consciously" or "intentionally". It has to behave as if it made differential recognitions, selective responses, taking some things or processes as the same for purposes of its functional response (same response to each member of a set), but still be capable of responding differently (to the whole set) in a different context.

Let's go back to our paramecium. Think of it as a system, a black-box, with inputs and outputs. There is a molecule in the water around it; it reacts internally to that molecule in a way that starts its cilia moving faster. Which way does it move? Well, as it moves it encounters other molecules, and its membranes can "classify" these molecules as like or different from the first one. Spinning about a bit, there is a higher concentration of these molecules in "front" than "behind", and it moves that way, and so on, in effect following the concentration gradient of the molecules, as we would say, towards its source (the food object). But it is unlikely that a single-celled paramecium forms some sort of representation of the food source, the destination. Nevertheless, it is not moving as a mechanical response to the chemical reaction of the molecule(s) to its outer membrane. It is integrating "information" from multiple molecule-encounters across time and space. It is itself much, much bigger than these molecules. And if the situation is different: if it's not hungry, if it's not got much energy reserve for swimming, if it also encounters "threat" molecules en route, then it will behave differently. Its response is context-dependent.

Consider next the analogous case for humans. You walk into a room, you breathe in an aromatic molecule along with some oxygen, the molecule interacts with a membrane of your olfactory bulb, you smell “coffee”, and you do what the paramecium does, tracking the scent to its source. Or not, if you don’t like coffee, if you’re feeling wired from already having had too much, if the social situation is such that it’s not appropriate just then, if you’re anticipating heartburn, etc.

What is striking in these cases is that the signified, or more exactly in Peirce’s terms, the interpretant, and behaviorally the visible motor response to the interpretant, occurs at a vastly different space-time scale from the encounter with the signifier. A molecule interacts with a membrane on a tiny microscopic scale, but the reaction occurs at the whole-organism scale, many orders of magnitude larger. And indeed the effect of contextualization, of context-dependence, depends, materially, on this. The paramecium finds food by integrating contextual information across space and time (“evaluating” the gradient of the concentration, the presence of other molecules, its current organismic state in other respects). So do we. A molecule interacts with a membrane in our nose, on a vastly smaller scale than our response, which is integrated over our whole organism, and across time (in memory and through action); our response occurs adaptively and functionally (or not) on the whole-organism scale.

Materially, semiosis happens across space and timescales of at least a few orders of magnitude (powers of ten) and in complex living systems, across many more. And it must. The S.I. must be enough larger, and more durable in time, than the signifiers (interactions with these), so that it can assess and classify contexts, situation-types, involving itself and its interactions in its environment, across space and time, at least up to its own organismic scale, and in some cases well beyond (the space of exploratory behavior, the timescale of longterm memory).

Theoretical biologists such as Jesper Hoffmeyer, Howard Pattee, Stanley Salthe, and others have argued that the emergence of life, or at least of functional cells, is co-occurrent with the first semiosis. Functionally, single cells make meaning, even if they do not have the complexity to represent it to themselves. Single cells, and maybe even large stretches of membrane, operate as S.I.’s. They do semiosis, they take A as standing for B in a context dependent way. Presumably, they learn, in the sense that developmentally they come to effectively, functionally, recognize, classify, and contextualize. Maybe there is very little latitude from the species norm for this, maybe much of it is hard-wired. But no matter how narrowly constrained, developmentally, genes cannot materially determine anything in causal terms. They are just recipe books consulted by the cell’s larger machinery, which determines what recipes get cooked when and how often and what happens to the results. That larger machinery is itself part of an ecology which co-determines with the cell’s internal processes the epigenetic trajectory of gene expression. I think we can at least see development as learning even in the single celled case, whether there is additional learning beyond “maturity” or not.

Can something still simpler do semiosis? I believe it is possible that the intracellular transcription mechanism that converts DNA to RNA, that in effect “reads” the base-pair code one section at a time, ignoring some stretches, transcribing others, under the direction of various guide molecules which are much larger than the active transcription sites, and which appear to read DNA segments differently depending on what base-pairs appear at far-distant sites on the same, or different, strands, may qualify by our definition. This little subsystem appears to make context-dependent readings or responses across much larger space and time scales than the encounters with the “signifiers”.

My guess, and I am not a molecular geneticist, is that what we see in the case of DNA transcription sub-systems is a reduced, derived case within the cell or its nucleus, of what may have operated on a more cell-wide scale, or at the scale of whatever the precursor to the modern cell may have been.

In any case, I think we have here a model for the material process of semiosis, of meaning-making, in its most rudimentary form. It is not less primitive in evolutionary terms or system-complexity terms than the rudiments of feeling as we described them in the previous section. They are co-eval, and they are in fact the same process.

What is our human interpretant in the case of the coffee smell? In all, it’s rather complex, and extends across time, but it would include not just the indexical sign relation of the (interpreted) smell to coffee (as substance and perhaps taste, in imagination), but also the feeling of, say, desiring coffee, the anticipation of the feeling of well-being from drinking the coffee. Or alternatively, the feeling of jitteriness and disinclination to the coffee, or the anticipation of embarrassment if going for the coffee would be socially inappropriate. If we were to exclaim, “Oh, great, coffee!” this response would be arising jointly from the feelings as well as the interpreted meaning of the smell-as-sign-of-coffee.

I am not denying that there are different specific mechanisms, neural routes, evoked hormonal and neurotransmitter secretions, associated actions (glancing about, looking to others for confirmation) and interactions, that engage some of the same and some different parts of the body and the environment in those aspects of this very fully integrated process that we conventionally think of as the meaning-interpreting side and the feeling side of it.

But there is no fundamental divide, either materially in terms of scales and participating body elements, or functionally in terms of sense-making, evaluation, imagination, and impulse to further action.

We do not make sense without the integration of feeling. We do not imagine meanings unaccompanied by any specific feeling. We do not evaluate by either meaning-processes or feeling-processes alone, but only by their integration in unitary processes. The continuous flow of action (even when action is inhibition of movement) proceeds jointly from meaning-interpreting and feeling processes.

Feelings are dependent largely on the same contextual factors as meanings in any particular occasion. The C contexts we defined for meaning-making and their anticipated associations of A's and B's also include the feelings of these situations and expectations.

The material system substrate of the S.I. for meaning-making is the same as that for feeling processes. How can it not be? That is the only material system around. It may, as with the Umwelt, feel differently on different occasions, or for different purposes, as part of different activities, have different saliences, in part generated by and in part generating the feelings.

The process of meaning-making itself always has a feeling. It may in some cases be the feeling of calm disinterested inquiry (rarely enough!), but it is always a feeling, and more often it is the feeling of curiosity, of anticipation, of effortfulness, or of frustration. It can be the feeling of surprise, or dismay. The very pursuit of Reason is driven by Desire.

Nor are feelings ever meaningless. The same processes that produce the feelings we feel are there to produce the meanings of these feelings for us. A feeling is an active process, very often an active engagement with the world that tells us something about the condition of our inter-activity in that moment, or over some duration. What it tells us would not be useful if it was not also a meaning, and we can say that feelings are interpreted as signifiers of something more, some conditions and processes in the organism and between us and the environment on still longer timescales than those which generated the feeling initially.

I do not want to push too hard or too dogmatically for the identity of feeling and meaning processes. It is enough that we understand them to be of the same order, with no unbridgeable gulf or opposition between them, and always functionally integrated. Nothing that the one does can it do without the other. Feeling and meaning are co-eval, co-evolved, functionally complementary, co-determined, and co-determinative.

A few more references: The work of Jesper Hoffmeyer already cited is perhaps the best guide to the questions of cellular semiosis. For related perspectives in cybernetics, developmental, and evolutionary biology see (Brier, 2008; Salthe, 1993). From my own work, most relevant to the topics above are (Lemke, 1993, 1995, 2000c).

### ***Understanding Systems across Scales***

So far, we have described a way of understanding feeling and meaning as material processes in a dynamic, open system. We have not said much about how to understand such systems, or how the complexity arises in them that is needed for semiosis and feeling, much less for some sort of consciousness of these processes.

I don't want to go into this topic here in too great detail, because I want us to move on to considering the variety of different kinds of feelings, their relations to meaning, and how to productively study meaningful, feelingful, activity.

First, however, a few notions about complex dynamical systems. A material system is a set of interdependent processes, together with material media and things in and through which these processes occur. Such systems may be, for analytical purposes, classified as either closed or open, depending on whether they do (open) or do not (closed) exchange matter, energy, and information with their surroundings. In practice all real material systems are open to some degree, but the ones that interest us here are those which only exist because they conduct such exchanges. These are variously known as dynamic open systems, self-organizing systems, or autopoietic systems.

The simplest example is a flame, which consists of the rapidly oxidizing chemical processes (burning) and the physical, hydrodynamic convection processes (heat-driven flow), together with the medium (the gas or wood) which is burning to produce the flame. The flame only exists so long as oxygen and gas are being drawn into it, and energy (heat and light) are being released from it, at a steady rate. The actual shape of the flame, and its temperature and the rate of burning are determined by the interaction of all the processes on which its existence is dependent. The flame "organizes itself" as a functional system through these interactions.

And so does a forest fire, or a tornado or a hurricane, or a lowly dust-devil. In fact even the pattern of flow and bubbling of a boiling pot of water can be considered such a system.

But this alone is not enough for semiosis. We need such a system to be, in addition, organized across a wide range of spatial and temporal scales, and in such a way that it can differentially respond to different potential signifiers, and do so in a context-sensitive way. I am not sure that it is as yet totally clear just what the necessary conditions are for this, though we obviously know some sufficient ones from the cases of living systems. Is some sort of memory required? Do individual systems need to go through a developmental progression, including initial learning? All our known cases do seem to do this, to one degree or another, but these conditions may or may not be necessary.

What we do know is that the cross-scale organization of complex systems of the sort we are interested in happens according to what I call the 3-level Model (developed by Salthe for discussing the hierarchical organization of biological systems, but likely much more general). In this picture, new levels of organization are added to a system in between prior levels (and not, as is often imagined, on the top or at the bottom of the pre-existing hierarchy). The "levels" here are characterized by the timescales of the basic processes that constitute the organization (self-organization) at that level: how long do they take to run their course, or to repeat? It is normally the case that such levels are also characterized by their material extension: how extended in space, how much matter is entrained in the processes. What we will call the "higher" levels are the

bigger, slower ones. The lower levels are relatively much faster and smaller (i.e. the units of organized activity are smaller, though there may be many of them).

The classic example is a complex living organism: at the “top” the whole organism, next down, the individual organs, then the tissues that comprise the organs, then the cells that comprise the tissues. If we want to go higher up, then the local ecosystem to which the organism belongs. And lower down, the organelles and membrane structures within the cell. Down to molecules, and up to galaxies.

This picture however is slightly misleading in that it emphasizes a compositional hierarchy of stuff, rather than a functional hierarchy of processes. It is what the cells and tissues and organs are doing, the flows of blood and neural impulses, the saccadic eye-movements and large muscle movements, that are among the basic units in this model.

What is important is the nature of the relationships between levels. Each higher level sets constraints on what can happen at the level below; the activity below has to somehow be able to “add up to” or support the functional behavior at the higher level. The higher level is the functional “niche” which the lower one fills, and of course in general it can be filled in many different ways. The lower level is constitutive of the higher one, its processes make up what is happening, or can happen at the next higher level. But again there are many possible larger functional wholes that can be built on the lower level’s processes.

So how do such multi-level systems gain any stability? If both up and down there are many possible combinations? Think of all the brain-scale processes that can be built up out of neural impulses, or all the different kinds of organisms that could fill a given ecological niche. Cross-level stabilization (meta-stability, a dynamic, contingent stability, not a mechanical stability) is achieved by stacking more than two levels.

A new level of organization emerges (i.e. self-organizes) between two existing levels, in such a way that (a) it organizes the possible interactions of the processes at the level below in a way that is functionally consistent with the constraints or “needs” of the level above, and at the same time (b) it “buffers” the level above against fluctuations in the processes at the level below that might be de-stabilizing. The emergence of the new intermediate level alters both the level above and the level below in these ways. Analytically, any level we want to study (which I call the “focal level”) always needs to be situated between at least one level above and one level below it, and its relations and functions relative to those levels need to be specified.

What about going more levels up or down? In most simple physical systems, this is not necessary, or just one more each way is enough, for the basic reason that each next level is operating far faster or far slower than the focal level. If levels operate at timescales of at least 50x and more often 100x or more faster or slower than each other, then the transfer of energy (and so of information) between them is extremely inefficient and for most purposes negligible.



Consider for example, if you run across hot sand at the beach. The faster you run, the less time your feet are in contact with the sand, and the less net heat is transferred to your foot, avoiding a burn. From the point of view of water running down a river to the sea (months), the pace of the ice ages (tens or hundreds of thousands of years) is negligible, in both directions. (There are of course exceptions, when some feedback loops produce more rapid changes.)

But biological organisms are already at work from an early stage of evolution in finding ways around this. Organism level events (a sudden shock) can lead to release of hormones that affect individual cells (en masse). And we have already seen the reverse case of the coffee-molecule affecting organism behavior. How is this possible, despite the general rule against direct interaction between non-adjacent levels of the (process-) organizational hierarchy of levels?

In much the same way that culturally, human beings' current actions (say lifting a stone into place in a building) can be influenced by long ago or long-term processes (the design of the building), through the mediation of a semiotic artifact: the architectural plans and building instructions. This process, which can be termed "heterochrony" amounts to the "folding" of space and time through the mediation of artifacts which can be "written" and "read".

Of course the full system needed to do this involves the community, learning to read and write and interpret architectural drawings, etc. And it also involves feelings: the desire to build, the curiosity about the plans, the satisfaction of seeing the building going up coherently, etc. At many timescales of feelings and actions, from the nagging sense that maybe you better look at the drawings again before locking the stone in place, to the pride in the finished building.

Before leaving this important discussion of the material systems in and through which meaning and feeling happen, I want to mention another important conjecture about the relations between levels in semiosis-capable (and so feeling-supporting, or aesthesis-capable) multi-level dynamic open, self-organizing material systems. Semiotically, there are two broad, complementary ways in which meaning can be made: by kind or category, and by degree or intensity. Signifiers, signifieds, and interpretants may all be categorical or continuous (Peirce gives a more complex analysis, but this one makes the key point) and so semiotic relationships may involve all the possible combinations.

Normally we think of these sign elements as types, as meaningful categories or classes of items (things, events, processes). But this view tends to exclude feelings, which are importantly also matters of degree or intensity. In simple cases of indexical meaning, say the height of a column of mercury in a thermometer as an index of the ambient temperature, both the height and the temperature are matters of degree (literally and in the sense of quantity). If it was a digital thermometer, the temperature would still be by degree, but the readout would be categorical (either this numeric display or that one).

It seems reasonably clear that feelings are degree-based interpretants, but a more general question concerns how, as we move across levels in an S.I., type-based organization and degree-based organization are related to one another. The conjecture I want to offer, and which I have called the Principle of Alternation, is that each successive level in the organizational hierarchy re-organizes type-based relations into degree-based ones, and vice versa (Lemke, 2000c). This is perhaps because these two kinds of meaning (and feeling) are indeed complementary to one another.

So, for example, the concentrations of neurotransmitter chemicals in nerve cells and synapses, or their associated electrical voltage potentials across nerve cell membranes are matters of degree. But whether or not a neuron fires is a matter of crossing a threshold, and patterns of firing or not firing are matters of type or category (digital, not analogue). If these nerve firings enervate fine muscle movements, say of the lips and tongue and vocal cords, those movements are again matters of degree, as are the acoustic sounds produced, as you might see them on an oscilloscope (sonogram). But when our auditory-brain-language processing system as a whole integrates them over time, what we hear are discrete, contrasting sounds (phonemes of the language) and the discrete words they make up.

What seems to be happening is that in one case quantitative variation at the level below is being integrated over longer timescales and typed or chunked as discrete types for the level above. In the other, the accumulation of many discrete types of events is averaged over time to become functionally a rate or concentration (recall our hungry paramecium) for input to the level above.

No doubt things are not entirely this simple, but it is remarkable in how many cases this principle of alternation seems to apply. If we look up and down across many levels in any functional process, it seems clear that there are always both matters of type (category, classification, discrete signifier and/or interpretant) and matters of degree (quantitative variation, frequency of occurrence, intensity of phenomenon) essentially involved. I believe this helps us understand how both the sense of meaning as (implicitly discrete) A's/B's//C's///S.I.'s and of feeling as the associated aspect of degrees and intensities of bodily processes always come together in the course of our on-going animate inter-activity.

For additional discussion, see also (Lemke, 2000a) and (Serres, 1982).

### ***How Many Emotions Are There?***

Let's return now to some more specifics about feelings and how to analyze them as an integral component of the meaning-making process (or vice versa!).

I have been using the term feeling rather than emotion, or affect, to distinguish my conception (a) from more substance-like views, that emotions are some sort of "things" rather than processes, and (b) from the common attitude, especially

in psychology it seems, that there are a relatively small number of them (in some views as few as six!).

Insofar as feelings arise in and through continuous material dynamical processes in time, they are not necessarily discrete and so also not specifically nameable. Most feelings are unique to the moment they occur, to the state of the body and its interactivity in/with the surroundings. They are “too specific for words”. It is only when we represent them to ourselves in the terms of verbal language, or classify them as belonging to some idiosyncratic class of familiar, if not nameable, feelings that we get the sorts of commonly referred to (and culturally-specific) feeling-types. This process of classification and discretizing would appear to be another example of the transformation of the continuous into the discrete.

So one answer to our question above would be: there are an unlimited number of possible feelings, each unique in its experienced qualia. We can however still find it useful for some purposes to examine the kinds of classifications of feelings that our natural languages provide, along with the basic phenomenology of their qualities (e.g. intensity, duration, onset, etc.). In doing this we will still find that there are a very large (many dozens) of named “emotions” or affects.

There are a number of approaches in linguistic semantics to the analysis of Affect, and one of the most useful is that of James Martin in his theory of Appraisal (resources for judgment, evaluation, appreciation, and affect as meaning-making options in English). I will refer to this again in the next section when we consider interrelations of feeling and meaning as processes, particularly in relation to the function of evaluation. Some additional helpful work following in this line of analysis has been done by Monika Bednarek on data from substantial corpora of texts. See (Bednarek, 2008; Martin & White, 2005).

My own work on the language of evaluation also appears quite useful here, in that many feelings can be regarded as evaluations of our own present condition, along the general lines of the semantic options for what kinds of evaluative qualities a proposition or proposal can have. See (Lemke, 1998b).

But before jumping to those subtleties, I think we should begin with the basic fact that the most omnipresent and often the most intense feelings are those that seem to monitor large-scale, survival-relevant conditions of the body in its environment. I call these, for now, the Bodily Feelings, though of course all feelings originate at least partly in the body and are felt in and through it. But feelings such as: alertness, fatigue, drowsiness, hunger, satiety, nausea, pain, dizziness, restlessness, energy, and sexual arousal are particularly common and seem to index conditions that are widely recognized and at or near the organism scale.

Of course these feelings can be semiotized and taken as signifiers, as signs of various possible conditions, effects of the environment, motivations toward action, etc. In fact, once we are in the habit of using language to mediate our

representation to ourselves of experiences in general and feelings in particular, it is hard *not* to do so. This leads to the possibility of distinguishing between the qualia of the feeling itself and the meaning or interpretation, including the evaluation, we attach to it. Of course that meaning-making in turn will also evoke a further, and generally a different feeling as well.

Some of these Bodily Feelings index a general readiness for action, or lack of it, but they do not for the most part point us toward particular actions or targets for those actions. There are other feelings, however, which certainly do, and a subset of these has often been identified as being the “primary” emotions. I think the original intuition about what makes them primary was, from Darwin, that humans share these with other animal species (though I doubt that this is really the case). And following that, that these particular feelings have the most direct relevance to survival and adaptation to threats and opportunities in the environment, or at least that of humans in some imaginary “wild” environment. Once the list was canonized, subsequent researchers have invented their own justifications for it. On the whole however I find the designation of a small number of named feelings as more “primary” than all the others very unhelpful.

Darwin (1872/1998) is often blamed for the short list: anger, fear, surprise, happiness, unhappiness, and disgust, though I think William James (1884) may be a more likely source, as Darwin’s table of contents lists 34 by my count. Darwin was reasoning from the visible expressions of presumptive emotions in animals (dogs, monkeys, etc.). The short list above has its modern version in, say, Tomkins (1995): interest, enjoyment, surprise, distress, fear, anger, disgust, contempt, shame (9). Or Roseman (1984) who has 18, clustered by some dimensions. Lazarus gets it down to six again: anger, guilt, fear, sadness, happiness, hope (Lazarus & Lazarus, 1994). And there are many more, but in all cases they are aiming for a universal, i.e. cross-culturally valid set, and their criteria of classification acknowledge little or nothing of culturally-specific traditions or local conditions (except, obviously, their own).

It seems incredible to me that anyone could imagine that feelings are universal across culture and history, much less across species, when it seems perfectly obvious that feelings to which we give the same name do not feel the same to us on different occasions across our own lives. Nor does experience teach us that different people feel love or anger or fear, much less pride or guilt, in the same way. And cultural anthropologists, not surprisingly, have no trouble identifying named emotions in non-European cultures that hardly even make sense to us, much less ring a bell of familiar recognition (e.g. Lutz, 1988).

The cultural and linguistic classifications of feelings are not the feelings themselves and have only a rather tenuous relationship to them. They can be used as guides to the experienced facts, cumulated in the wisdom of natural languages over centuries, that feelings are different, and that the circumstances in which distinct types, or instances which we learn to feel as being similar, most often occur are often but hardly always, themselves distinguishable.

Non-linguists, and I am afraid even linguists who have not done deep studies of the semantics of extended text and discourse, often fall into the fallacy of looking for the best equation of semantic items and feelings at the level of individual words or short phrases. That is not reasonable. Feelings are highly specific, indexing as they do, the condition of a very complex, multi-component, multi-level, interacting system-in-a-surround. Of course they can be classified into cultural categories, but that tells us relatively little about what they are or how to distinguish one from another at the level of instances of feeling.

A far better approach derives not from the semantics of words (or from even more abstract, putative semantemes) but from the semantics of *extended text*. Read the poets and the great literary writers if you want to get some sense of how the richness of our feelings can be represented in language. Language that itself evokes feelings in the reader (or listener) comes far closer to the specificity of actual feelings than can the mere names of broad, abstract, categories. We will return to this later in a discussion of the analysis of feeling-and-meaning through rich media data, such as video recordings.

Note in passing that what I have just said about feeling is equally true of meaning. Every occasion of meaning-making makes a meaning that is extremely specific and unique to that occasion. Extended text, of the kind that is not likely to be repeated on any future occasion (except by quotation) comes far closer to making such meanings in overtly verbal form than single words or very short texts or utterances (though note that we never make meaning with words alone; and the actual meaning-making is the process as it occurs in us and our surroundings -- the utterance is only one part of that process, and the text merely its trace left on the page, or screen).

But the classic "Darwinian" emotions do have something in common, and do point us to some useful features. Fear is specifically fear of something (generalized anxiety is different, more akin to the Bodily Feelings above), anger is anger at something (or someone), desire is desire for something, disgust is disgust at something, and likewise there is surprise at something, happiness or unhappiness about something (distinct from generally feeling-good or -bad). And they each also tend to be strongly associated with an action directed toward their respective objects: to flee what we fear, to attack what we are angry at, to seize what we desire, to obtain more of what makes us happy and avoid what makes us unhappy. (Surprise does not seem to fit this pattern, unless we consider preparation for flight a response action, and that does not seem to be as general a response as the others.)

We can also feel guilty about something, but what does that impel us to do? Nothing very obvious. We can feel shame about something. Does that impel us to, say, hide, in the same way fear impels us to flee or anger to attack? Doesn't seem that way. Does pride impel us to, what? Preen? What does hope makes us want to do? None of these fit the bill; they are not emotions in the same sense as the others (and neither I think is surprise for the same reason).

The *emotions*, as I will try to more carefully use the term now, are feelings about our relationship to a specific object (target, person) in the environment that impel us to action in some very common way and to a powerful degree. Painting these matters in the very broadest strokes: to avoid or flee (fear, panic, unhappiness, disgust) or to seek out (desire, happiness, anger) and in coming to the target to nurture it or to destroy it. The very term e-motion has long had something to do with motion, action, motivation, and in the usage here will keep that sense specifically.

But what of the other feeling categories? What of surprise, anticipation, pride, hope, guilt, shame, the feeling of nobility, of courageousness, of self-confidence, uncertainty, boldness, shyness, willfulness, arrogance, humility, remorse, reverence, or scorn? And quite a few more? Take any good thesaurus (of the original Roget's variety, where words are organized by their meanings, not by their spellings) and you will find hundreds of named feelings. Try it yourself with such linguistic frames as: "I feel very ...." or "The feeling of ...." or "It felt very ...."

Doing this I have compiled a hopefully representative Big List of over 250 named feelings, following the first two such frames (I am just starting to explore the third).

Of these, 20 or so seem to fit the pattern of the Bodily Feelings; they index general bodily conditions, do not identify a specific external target or source, and do not impel us to any specific action. There are others which also fit these criteria, but where some evaluative dimension beyond simply a general positive or negative affect seems specified to some degree (e.g. general anxiety, calmness, depression, boredom, strength/weakness, etc.).

The next group are the Emotions as I have defined them. As named feelings, they have connotations of degree or particular evaluations (e.g. dread, panic, terror as high degrees of Fear, wariness or apprehension as mild degrees; suspicion as adding further evaluation). Variants of Anger include fury (high degree), feeling miffed (low degree), hostility, jealousy, and indignation. And so forth. A substantial amount of further semantic analysis could be done to categorize these variants according to their typical meanings for us, and so also much further research to understand how they specifically feel to us. This group comprises about 75 named feelings.

All the rest are what I might term the "Higher Affects" along the lines of Vygotsky's notion of the Higher Mental Functions. They are "higher" in the sense that meaning-based evaluations and cultural variation seem more implicated. Many of them are self-evaluative according to some cultural criteria. They include feelings such as hope, disappointment, wonder, pride or nobility and generosity; feeling that you are self-confident, attractive, successful; or feeling extravagant, generous, guilty, virtuous, etc.

All of the Feelings are explicitly or implicitly evaluative, they all tend to feel good or bad, to some degree (allowing for one neutral "Satisfactory" state which feels neither way and tends not to be noticed except by its absence). Some are

evaluative towards an “outside” object (i.e. evaluative of our relationship to something we are or may be interacting with), and some are more evaluative of our general “mood” or current condition, or simply descriptive of it, but with an evaluative connotation. In common parlance these seem “self-evaluative” (e.g. the feeling of pride, of stubbornness, of self-confidence, shyness, mirthfulness, reverence, humility, and many more).

In the next section I will describe further this important area of convergence between our cultural meaning categories and those for feeling-types: the domain of evaluations.

### ***Evaluations: Meaning and Feeling***

What kinds of evaluative meanings are there? Somewhat surprisingly (and that’s one of them), it turns out that if we are evaluating states of affairs, happenings, events, or generally propositions (and mostly similarly for proposals), there are only about seven different semantic dimensions on which propositions can be evaluated. Another way of saying this is that propositions only have seven possible properties, and they are all evaluative properties. This has been known in linguistics for a long time for special cases (e.g. Greenbaum, 1969), but only recently I think understood in its full significance and verified by large-scale corpus studies (Bednarek, 2008; Francis, 1995; Lemke, 1998b; Martin & White, 2005).

So what are they? Desirability, Appropriateness, Probability, Usuality, Importance, Comprehensibility, and Seriousness. If we are evaluating a proposition like “John is coming.” We can say, for example:

It is very good that John is coming.  
It is really highly inappropriate that John is coming.  
It is very unlikely that John is coming.  
It is really surprising that John is coming.  
It is very important that John is coming.  
It is entirely understandable that John is coming.  
It is really funny that John is coming.

In all cases there is a polarity (good/bad, in/appropriate, un/likely, un/surprising, understandable/mysterious, funny/serious); there is degree (very, highly, slightly, etc.); and there are of course subtler variations of meaning within these categories (good, desirable, wonderful, etc.; obligatory, appropriate, forbidden; probable, possible, certain; comprehensible, mysterious, confusing; funny, serious, ironic, and the like).

Similarly there are feelings that correspond to these same semantic categories:

I feel good, desirous, desirable, etc.  
I feel guilty, proud, ashamed, etc.  
I feel certain, doubtful, convinced, etc.

I feel surprised, astonished, bored, etc.  
I feel important, reverential, scornful, etc.  
I feel confused, mystified, enlightened, etc.  
I feel serious, amused, mirthful, etc.

As noted earlier, single words are often not quite enough, and even more often are not entirely idiomatic in expressing these categories of feelings. There are also some other semantic components which combine with these basic dimensions (the different basic kinds of evaluations), such as whether we are evaluating ourselves, others, general conditions, relationships, etc.

All feelings appear to be evaluative at least at the basic level of polarity: good or bad, desirable or undesirable to some degree. So for the bodily feelings, nausea or dizziness or hunger feel undesirable; alertness, satiety, elation, the reverse. Among the emotions proper, if we consider say "I feel afraid, anxious, threatened, panicky" and the like, they are clearly un-Desirable, but they are also felt as Important, may be further evaluated as Appropriate or Inappropriate, most likely as Unusual (though not always), and Serious, and may range from Comprehensible (I know why I feel this way) to Confusing. Such feelings are also generally Certain, rather than mere surmises about which we are in doubt regarding the fact of whether we feel them or not.

Anger can range from Desirable (justified) to Undesirable (irrational, uncontrollable); likewise for its Appropriateness; the feeling is Certain, usually not Surprising or Mysterious to us (though possibly so), definitely Serious, not funny, and almost always Important.

Desire may or may not be desirable, appropriate, surprising, mysterious, but it is almost always serious, certain, and important.

And so on. Feelings are not just evaluations, they are also in some sense direct reports on the condition of our standing in the world, but we have them because by and large they are important for our survival and our choices. Ignoring or suppressing feelings, however appropriate for some types of people in some cultures, usually does not end well for the organism, and often also not for the community or its networks of interdependent practices.

There are other categories of feelings that do not so easily fit this scheme of the seven basic dimensions of evaluation, because these dimensions are specific to the evaluation of propositions or state of affairs, and not to, say, aesthetic judgments or evaluations of people. One important such category, for which there is an analogue in the semantics of evaluation, is Capability. Sometimes regarded as an 8<sup>th</sup> dimension, the analysis is complicated by factors I am leaving out here (propositions vs proposals, realis vs irrealis). But certainly we have feelings of being more or less capable, mentally, emotionally, physically, financially, etc. We may feel powerful or powerless, confident or shy, even lucky or unlucky, not just in general, but in specific moments and situations.



Insofar as meaning and feeling together serve the function of evaluation (and through it of choices to be made along the course of action, including the activities of reasoning, problem-solving, etc.), they are mutually evocative. Meanings are made by the deployment of semiotic resources, such as language, visual depiction, gesture and movement (regarded as signifiers), music, actions and indeed feelings as such.

Contrary to some other, more mentalistic views about meaning-making, I would deny that there is any *lingua mentis* as such, apart from imaginings of speech, text, visual representations, and these other semiotics. “Thoughts” are precisely these imaginings, or we may say, such semiotic actions without their full motor expression (though including, I think, most often some partial activation of the motor neuron pathways). “Concepts” are most often verbal semantic expressions, though in some cases, perhaps most, conflated with certain feelings, and perhaps also integrated, as in the case of many scientific concepts, with mathematical expressions (a semiotic resource derived from natural language), diagrammatic or graphical representations (considered dynamically, as processes), and even physical operations (e.g. measurements). Those seeming thoughts which do not appear to have linguistic or visual content (or any of the others so far mentioned) are usually semiotic expressions in which the signifiers are in fact feelings and imagined proto-actions (i.e. actions without full motor expression).

Somatic states, or conditions of the organism-in-interaction, are as much produced by the affective aspects of languaging and symbolic visualizations, etc. as they are the sources of them. We do not just use language and other semiotic meaning-making resources to interpret and evaluate somatically-based feelings, we also, by using semiotic resources and imaginative capacities generally, evoke feelings in ourselves and others through the affective connotations of our symbolic productions, and these in turn stimulate associated somatic states. It is very important to understand this circularity or reciprocity between meaning-and-feeling and the conditions felt and meant. Making meaning changes how we feel and how we are, both physiologically and in terms of how we are interacting with the world. Semiotic artifacts or works (texts, images, video, etc.) evoke meanings and feelings through the process of our interaction with them, which is at the same time both a material interaction and a semiotic and “aesthetic” (i.e. feeling-making) one. As we interpret a text, we are producing not only meanings but feelings, nor is it possible not to, because the same material processes that make one make the other as well. This is especially clear if we consider that a different interpretation of the meaning will be accompanied by a different feeling.

### ***Chronopaths: Meanings, Feelings, and Media***

I first felt the need to examine the integration of feelings in the meaning-making process when I began to study complex, immersive, over-time experience in and with computer and video games. I undertook this study because these games were and are the most advanced multimedia integrations of several semiotic

resource systems: visual spaces, movement and gesture, action, music, speech, text, etc. I wanted to know: *How can these systems be combined?* and *What kinds of meanings are made through their combination that exceed what can be made with each separately?*

It was already clear to me that:

(1) we never make meaning through only one semiotic resource at a time, because the materiality of all signifiers implies that they can always be interpreted in related to multiple semiotic systems (e.g. writing is both verbal and visual, speech both verbal and paralinguistic, etc.); and  
(2) the space of possible meanings is enlarged combinatorially when different sign systems are combined, such that the meaning of any one combination (really of the multimodal interpretant constructed) is thereby all the more specific, being one out of a much larger possible set.

This is how, for example, meanings that are more specific than words can say are easily constructed semiotically. For more detailed discussion see (Lemke, 1998a).

But it is also especially clear in the case of multimedia digital games (videogames, computer games, etc.) that the meanings we make as we play through them depend heavily on our feelings. Do we feel fear? Anger? Apprehension? Anticipation? Do we feel under the pressure of time or important consequences, or at leisure? We make different choices according to our feelings, as much so as according to our meaning-interpretations of the scene presented to us in the game and our interaction with its virtual world. You cannot analyze the progression through time of the meanings-made without taking into account the feelings-made as well. Nor are these entirely separable, as discussed above. Different interpretations, different conjectures and imagined possibilities carry with them and produce different feelings, and these feelings in turn influence actions, which change the game situation, leading to new or revised interpretations, etc.

Experientially there is a trajectory through time, space, and situation, which is wrought by our own actions, feelings, and meaning-interpretations. (Insofar as such a trajectory also crosses boundaries of genres, situation-types, etc., I have called it a “traversal”.) This phenomenon, which is of course an exact analogue of our experience in daily life or in encounters with any semiotic medium (text, painting, film, etc.), called to mind for me Mikhail Bakhtin’s (1981) notion of the *chronotope*.

For Bakhtin, a chronotope characterizes a genre of fiction, or narrative: the typical way in which action and characters move from place to place or scene to scene (Greek: *topos*) through narrative time (*chronos*). In his theory, different fictional genres in different historical epochs had characteristically different chronotopes. But this notion can also be applied to an individual work or text: the trajectory of movement of action and characters from one scene, setting, place, challenge, opportunity, interaction, etc. to another. If we emphasize that in

doing so it is important to pay attention not just to the meanings being made (who does what to whom) from place-and-time to place-and-time, but also to the feelings being produced (in the characters, in the reader, in the imagined author or teller of the tale), then we might use a similar term: the *chronopath* (Greek: *pathos*, feeling). We will mean by this term the text-specific or genre-typical pattern of feelings evoked in the course of narrative movement through time from scene to scene, situation to situation, activity to activity.

Of course, I should say here not simply feelings, but as we now understand their unity, *feelings-and-meanings* made and evoked through narrative time in and across scenes.

I believe that this is an essential tool, or framework, for analysis of our experience with media, and also for the design of media intended to evoke or support certain kinds of experiences (meanings-and-feelings). Of course many other tools are also needed, from theories of narrative as a semiotic form, to linguistic and multimedia tools for specifying the meaning potentials of the words, images, actions, etc. presented or created, to a more exact means of analyzing the kinds of feelings co-produced with the meanings, and the kinds of meanings co-produced with various feelings in particular contexts.

This approach, it should be clear, applies not just to fictional narrative media, but also to the analysis of rich media records, such as video, of actual human activity in research programs. Of course all the activity we perform in games, or even in making meant-and-felt sense of a text or film, is equally real material-and-semiotic activity, but the constraints, conventions and probabilities, as well as the affordances and opportunities for meanings and feelings differ across media and types of activity.

While I have so far done some small scale analyses of this sort, there is much more to be done, and hopefully much more to be learned by filling in the very broad programmatic outline which I have sketched in this paper. I hope that on this basis a better start can be made. For further discussion of experienced multimedia, particularly computer games, and chronotopes, see (Lemke, 2005b, 2009a, 2009b). On trajectories and traversals, see (Lemke, 2005a, 2007).

### ***Appendix: Systems and Networks***

I have mainly used here the language of systems. I was raised as a physicist and this language is quite natural for me, but I recognize its limitations. And I recognize that what a system is for me is perhaps not what the term calls up for others. In the structuralism of the late 20<sup>th</sup> century, systems were formal systems of relations of relations among abstract forms, modeled on the phonological systems of contrasts in abstract sound features distinguishing different spoken words in various languages (Jakobson, 1971; Levi-Strauss, 1963; Piaget, 1970). In the same period, cybernetic systems were a cross between logical systems of dependency (necessary conditions for occurrence) and material systems of

cause-and-effect, in which some processes controlled or determined others (Ashby, 1956). These were engineering systems, designed in relation to function.

And then there were physical and biological systems, from chemical systems of inter-dependent reactions to ecological systems of inter-dependent organisms. While these were originally thought to be not so different from cybernetic systems, with determinacy and control through conditions, it soon became apparent that even a little complexity of the right kind (feedback loops in which potentially causal chains intersected and linked back to themselves so that effects became the causes of their own causes, shredding the logic of causality and predictability) resulted in systems that were largely unpredictable (Bar-Yam, 1997).

Such systems were also creative, generating unforeseen as well as unpredictable, qualitatively new phenomena. This became known informally as “emergence” and as one of the two basic characteristics of complex dynamical systems. The other was that such systems tended to be analyzable in terms of multiple levels of organization, each “higher” level re-organizing the processes on lower levels, and buffering still higher levels from fluctuations at the lower level. It was also recognized that these levels of organization had different characteristic timescales, that is, processes characteristic of the level itself would take 10 or more often 100 times as long to complete or repeat as the component sub-processes at the next level below.

Accordingly, in my use of the term, a system is never a system of things, never a static system. It is always a system of material processes, meaning that these processes are mutually interacting and mutually dependent on one another for the conditions of their existence. It is indirectly also a system of the participants (things, people, media, artifacts) in and through which those processes occur (cf. actants in Greimas and Latour). But the organization and properties of the system depend not directly on the properties of the participants, but only on the relations among the processes into which those participants enter.

Systems for me are always dynamic: they exist, like living things, only when their processes are happening, are on-going. And every process has, or defines, some characteristic timescale. Some processes happen faster or slower relative to others. The properties of system frequently depend on, or can be explained by reference to, the temporal coordination and dis-coordination of processes.

In particular there is a very important principle that processes which take place on very different timescales (say by a factor of several thousand or more) cannot efficiently exchange energy, and so cannot efficiently (or for practical purposes, at all) exchange information. They are adiabatically separated. This is the case in most complex systems for levels which are not adjacent. With an important exception: such levels can indirectly exchange information through semiotic artifacts (heterochrony). This is the basis of Latour and Serres’ notion of artifacts which fold time. They allow long-term processes of centuries’ duration, like the building of a cathedral, to be coordinated with processes of a few hours duration, like the emplacement of a building stone, through the mediation of architectural

drawings (and the S.I. of a community with the means to “translate” those drawings into actions).

In this understanding of systems, they are much more like Latour’s networks. In both there is essential mediation and linking across processes by artifacts and objects (natural and technical, hybrid) that mediate and make the configurations of linked processes possible and more stable, up to a point. In both there is a radical heterogeneity: systems and networks both include elements of the most diverse kinds, though in systems they are all material, and in networks some have a more ambiguous status (see below). A complex dynamical system can include a man, a brain, an amygdala, an axe, a tree, a neuron, an acetylcholine molecule, a hand, an arm, the air, a sound, etc. More basically it consists of processes in which these participate: inter-neural communication, swinging an axe as a motor process, feeling and hearing it connect with the tree, etc. You can trace it up-level to the practice of cutting trees for firewood, to institutions that make fireplaces and axes, to a national economy, to a continental ecosystem (and specifically again to the processes and practices that constitute these levels of organization). You can trace it down-scale to the electromagnetic repulsion of steel crystals’ atoms against the cellulose molecules of the tree, or to the interaction of neurotransmitter molecules with membranes on neurons.

If there was a sign on the tree indicating it was to be cut, or a word called out to coordinate the axe movements of two cutters, then, according to our model of the semiosis being performed as part of the dynamic operational processes of the system, the relevant S.I.’s would be integrating across space and time, and enacting conventions of interpretation of some larger community and its cultural norms and practices. The people who are part of doing this fold time through their memories and bodily habits (*habitus*, *body hexis*), across their participation in other events in which they learned to wield an axe, to cut a tree, to recognize the sign for to-be-cut, to respond to the coordinating spoken word, etc. There is a real sense in which the tree is being cut down by a vast system extending many years in time as well as many miles in space. Absent various parts of that extensive system, the axe would not swing into this tree.

Actor networks ala Latour emphasize the circulation within them, as systems models emphasize dynamic processes and their interdependencies; in both cases the network/system does not persist by material inertia, it must keep doing what it does to “live”. Actor networks however do not place much emphasis on time, on how long a circulation takes, on the importance of major differences in the time one circulation takes relative to another circulation. ANT tends to emphasize mediation by things, rather than mediation by processes (in which things are necessary participants).

It also aims to construct a flat world, in which there are no levels. But I believe that its aim here is quite similar to my own: not to reify higher levels or grant them prior existence and causal powers. And so ontologically it embraces heterogeneity: anything may be part of a circulation, mediated by anything else. But this is not contrary to a notion of levels based on timescales and organizational dependencies, and one where these are themselves emergent

from the processes so organized, indeed, as a whole, self-organizing. The systems model described here does not presume Social Forces or Institutions that have realities of their own and determine downwards what happens at the scale of everyday actions. Indeed I would not reify Language in this way, or Culture. A second reading of the meta-redundancy model is that the higher levels, such as what I called the culture of the community, are contingently and on-goingly constituted by the very fact of the redundancies at the lower levels. If how people speak changes, then their language changes (provided the local changes persist, propagate, and endure on the appropriate timescales). If how people behave in a given context changes, then likewise for their culture. If there is enough change in the weather for long enough, we call it a climate change.

Actor networks are willing to go one step further. They will allow imaginaries as mediators. That is, they operate with an ontological principle that every real thing is real in its own way; that we determine whether or not it is real by trials or tests that are in some way different for every case, though largely similar for large classes of reals that occupy homologous positions in similar networks. In that sense, for instance, if people believe in God, or in Minds, and act on those beliefs, then like good anthropologists, we ought to assign God and Minds their proper roles as mediators in the networks. They have consequences and so are real in their own way.

They are not, however, material, and so do not find a place in a complex, adaptive, semioticizing, multi-level, multi-scale dynamical open system (to give the full formulation of what I usually just call a system). However, the processes in which they play their roles ARE material processes: the talk, actions and behaviors, the justifications, arguments and texts, in which they appear, at least as forms with material representations. And these processes and practices do find a place in a material-semiotic systems account. People can say that God stands outside of time, or that Minds are not material, but their saying so does stand within time and is materially said.

So I believe that the view I am presenting here is largely consistent with and complementary to that of Actor-Network-Theory (ANT), despite some divergences. They are different tools, but fit, I believe, comfortably within the same toolkit for research and understanding. I have the greatest admiration for the theoretical as well as the empirical work of Bruno Latour and have often taken inspiration from his ideas and findings. For accounts of these issues from the viewpoints of Latour, Serres, and Greimas, see: (Greimas & Courtes, 1983; Latour, 1993, 1999, 2005; Serres, 1982).

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