Peter Pericles Trifonas *Editor*

International Handbook of Semiotics

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To my children Peirce, Anthi, Yanni… never forget to follow the signs

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Chapter 27
Feeling and Meaning: A Unitary Bio-Semiotic Account

Jay Lemke

27.1 Claims and Scope

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, and that meaning and feeling as processes 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.

In the course of these arguments, we will consider the relations of a unitary feeling-and-meaning process to movement and the animacy of living systems, to the semantics of language and more generally to multi-modal semiotic resources, and to experiential qualia. I have by no means put together a complete, consistent theoretical model of these matters. I do not in fact believe that doing so is either possible or desirable. Given the richness, complexity, messiness, and inevitable problems of self-reference involved, the best we can do is to assemble a toolkit of discourses and practices with which we can do useful *bricolage* for whatever our purposes may be in some specific inquiry or project. Whatever I offer here, more work will always need to be done to make sense of any actual lived trajectory of feeling-and-meaning.

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27.2   Is feeling a Kind of Meaning? 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 document living activity without slighting either the feelings that incline us to particular actions or the meanings through which we interpret and choose 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 reconceptualize feeling processes along the same lines that we have done in recent decades for meaning-making processes.

Meaning is a process, meaning-making, or semiosis. I do not use the term here to denote a relation (e.g., between signifier and signified, or among object, representamen, and interpretant as in Peirce) but rather the process of construing such relations, a process which takes place in a material system, is itself a material process (or functional system of interdependent material processes), and which functions to adapt an organism to its environment and give it enhanced capacities to alter that environment.

Meaning-making can no longer be regarded in sophisticated analyses as being something that happens in-the-head, or which belongs to a nonmaterial mental realm (*res cogitans*) apart from the material (*res extensa*) in the classic Cartesian sense. It should rather be recognized as being *distributed*: between organisms and environments, subjects and objects, cooperating persons and mediating artifacts. Its 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 "mediational 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, where relevance to meanings made, and to feelings produced, defines what is or is not part of the "situation."

Meaning-making, or semiosis, is also 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. The specific processes and their deployment vary: across human communities, individuals, situations, and moments. It is *locally specific,* and in common parlance *culturally specific*. The capacity to make meaning, or to participate in meaning-making processes, is universal for the human species (and for all other species, though in less elaborated ways), but the meanings actually made, the meanings which are typically made, the specific associations of meanings and situations, all vary.

All These Claims Are Also True for 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 themselves "in-the-head," mentalistic phenomena, purely individual and intra-organismic, passive reactions, and psychologically universal. We need rather to reconceptualize 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 reconceptualize feeling as distributed, situated, active, material, and locally and 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 "Passion" and "Reason," praising the latter and warning that the passions are 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. Such powerful political motivations have long kept the reason–emotion opposition alive when it might otherwise have died for lack of intellectual merit.

I will generally be using the term *feeling* here rather than either *emotion* or the more currently fashionable term *affect,* both to distance my discussion from these older prejudices, and to ground an approach to the "higher affects" (e.g., pride, sense of nobility, playfulness, reverence) and the classic emotions (love, hate, anger, fear, etc.) in much 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* (cf. cognition) 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 rethink 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 for now recall von Uexkull's (1928, 1982) notions of *Umwelt* and its less-well-known partners *Wirkwelt* and *Merkwelt*. In this account, 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 Three-level Model below), for now we shall put wholes before parts, asking always what happens within wholes to differentiate them into parts.

Let me conclude this section by returning briefly to the initial question: if we reconceptualize 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 and 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 and 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. I will return to this later.

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 to semiosis. 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 nervous system complexity, but at least when regarded as 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. It is for this reason, and in order to emphasize a material-process view of semiosis, that I align my arguments here with recent approaches to bio-semiosis (e.g., Hoffmeyer 2008).

27.2.1   *Pointers to the Literature*

I am trying in this complex 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 and 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).

27.2.2 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 our initially separate ideas about them.

Let's start with a little naïve phenomenology about feelings. 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 sensation, 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 (or 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, and 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. both before birth and after. 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 quaintly call experiential "qualia." This is what we recognize as the feeling of our feelings, what anger or fear or nau-

sea 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 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.

27.2.3   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 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 (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 something). 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 and 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 materialist theory 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 us 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 interact 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 seem 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 also a function of context on a still larger scale. 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 a context at a larger scale. A part of a 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, together with 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 that in some context C, we have a particular set of relations between As and Bs. 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 As and Bs (and whatever else) in the same contexts (Cs)? No, of course not. There is not one meaning-world for all organisms, or indeed for all individual people. Jakob von Uexkull's 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 still used in biology).

So, we need to extend our notation a bit more:

$$< A_i \, / \, B_j \, / \, / C_k \, / \, / \, / \, S.I._m >$$

where we now imagine different S.I.s (labeled by $m=1, 2, 3, \ldots$), each of which construes different situations or contexts, within which it will connect different As and Bs 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 As and the set of Bs 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 As and Bs! Bateson's called this "meta-redundancy" or redundancy among redundancies. It was a first key step towards characterizing meaning-making as *selective indexical meta-contextualization*.

This is a very abstract characterization. It is a logical formulation, following Peirce and Bateson, but it is also very specific: selective contextualizaton 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 just which combinations mostly likely occur depends on the particular S.I. In fact, the S.I. is semiotically defined by what it connects with what. And if we have a lot of S.I.s, then the particular pat-

tern 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 have called "cultures" for want of a better 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, about such a material system from the foregoing analysis of semiosis as a construal of logical relations or associations?

A material system that can do semiosis 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 in relation to the one versus the other. But it cannot be locked into mechanical, 100% predictable, ways of doing this. It has to be able to recognize, classify, and respond to the same difference differently in different contexts. Note that I mean this only functionally, I do not mean "consciously" or "intentionally." The system 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 us go back to the 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 tastier molecules, as we might say, towards its maximum (the food object). But it is unlikely that a single-celled paramecium forms any 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 is not hungry, if it has not got much energy reserve for swimming, if it also encounters "threat" molecules en route, then it will behave differently. Its response to the food-indexing molecules is context dependent.

Consider next an 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 parame-

cium does, tracking the scent to its source. Or not, if you do not like coffee, if you are feeling wired from already having had too much, if the social situation is such that it is not appropriate just then, if you are anticipating heartburn, etc.

What is striking in both 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 behavioral 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, etc). 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 (the micro-scale interactions), 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 (e.g., in the extended space of geographical exploratory behavior, or on the timescale of long-term 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 (see references below). 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 and functionally recognize, classify, and contextualize. There may be very little latitude from the species norm, 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, and that larger machinery is itself part of an ecology which co-determines along 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 in the simplest species.

Can something still simpler than unicellular organisms or single cells 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 timescales than its encounters with the "signifiers" provided by nucleotide differences.

I believe we have here, at least at the cellular scale, 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 coeval in evolutionary time, and they are in fact functional aspects of 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 imagined taste) but also the feeling of, say, desiring coffee, and 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-indexical-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, for what we conventionally think of as meaning interpreting and feeling. 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 between these two sides of a single unitary process.

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 of judgment. The continuous flow of action (even when the 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 As and Bs also include the feelings of these situations and expectations. Different judgments regarding classification or response will be made in contexts where we feel differently about the items or the task (e.g., in terms of their familiarity, desirability or dangerousness, evoked anxiety, need for haste, risk of error, etc.).

The material system substrate of the S.I. for meaning-making is the same as that for feeling processes. How can it not be? There is only one 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 interactivity in that moment, or over some duration. What it tells us would not be useful if it was not also meaningful, and we can say that feelings are semiotically 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 a complete 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 coeval, coevolved, functionally complementary, co-determined, and co-determinative.

For further background and detailed examples and arguments, 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).

27.2.4   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 do not 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 a rapidly oxidizing chemical process (burning) and a physical, hydrodynamic convection process (heat-driven flow), together with a medium (e.g., 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.

So does a forest fire, a tornado, 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 latter 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 Three-level Model (developed by Salthe (1993) 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 preexisting 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, e.g., by how extended in space they are, or by how much matter is entrained in their 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 flow of blood and neural impulses, the saccadic eye movements, and large muscle movements that are the basic units in this model.

What is important here 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 multilevel systems gain any stability if by going both up and down the organizational hierarchy there are so many allowed 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 destabilizing. 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 (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 50 times and more often 100 or more times faster or slower than one other, then the transfer of energy (and so of information) between them is extremely inefficient and for most purposes negligible. Hence levels more than two below or two above become practically irrelevant (so long as the system as a whole continues to operate normally).

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, and vice versa. (There are of course exceptions, when some feedback loops produce more rapid changes, as with a cancer from many levels below the organism scale, but which evades the buffering processes in between.)

Biological organisms are already at work from an early stage of evolution in finding ways around this so-called adiabatic insulation of levels. Organism-level events (a sudden emotional 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 distantly nonadjacent levels of the (process) organizational hierarchy of levels?

It happens 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 semiotic artifacts which can be "written" and "read."

Of course the full system needed to do this involves a community, learning to read and write and interpret architectural drawings, etc. And it also involves feelings: the desire to build, curiosity about the plans, the satisfaction of seeing the building going up coherently, etc. This is true 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 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) multilevel dynamic open, self-organizing material systems. Semiotically, there are two broad, complementary ways in which meaning can be made: (1) by difference in kind or category, and (2) by difference in degree or intensity. Signifiers, signifieds, and interpretants may all be categorical or continuous (Peirce gives a more complex analysis not needed for the current 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 varying by degree, but the readout would be categorical (either this numeral displayed or that one).

It seems reasonably clear that feelings are in part 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 categorical types for the level above. In the other direction, the accumulation of many discrete types of events is averaged over time to become functionally a quantitative rate or volumetric 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) $<As/Bs//Cs///S.I.s>$ and of feeling as the associated aspect of degrees and intensities of bodily processes always come together in the course of our ongoing animate interactivity.

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

27.2.5 How Many Emotions Are There?

Let us return now to some more specifics about feelings and how to analyze them as an integral component of the meaning-making process.

I have been using the term *feeling* rather than *emotion,* or *affect,* to distinguish my conception (a) from more entity-oriented 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.

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 class of culturally familiar, if not nameable, feelings that we get the sorts of feeling-types that are commonly referred to (and culturally specific). 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 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 (identifying linguistic 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 and White 2005).

My own work on the language of evaluation also appears 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 (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 as being at or near the organism scale.

Of course these feelings can be semioticized 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 and that meaning-making will also evoke in turn 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 protohumans 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 shortest 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 emotions by my count. Darwin was reasoning from the visible expressions of presumptive emotions in animals (dogs, monkeys, etc.). The shorter list has its modern version in, say, Tomkins (1995): interest, enjoyment, surprise, distress, fear, anger, disgust, contempt, shame (nine items). Or Roseman (1984) who has 18, clustered by some dimensions. Lazarus gets it down to six again: anger, guilt, fear, sadness, happiness, hope (Lazarus and Lazarus 1994). And there are many more such lists, 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 of different kinds, 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.

Nonlinguists, 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, multicomponent, multilevel, 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 specific instances of feeling.

A 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 concluding 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.

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 a more general euphoric or dysphoric feeling). And they each also tend to be strongly associated with an action directed toward their respec-

tive 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? It does not seem so. What, if anything, does pride impel us to do? Preen? What does hope makes us want to do? None of these fit the pattern of the object-oriented emotions; they are not emotions in the same sense as the others (and neither I think is surprise for this same reason).

The true *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. We are moved by the emotions, *sensu stricto,* to particular types of actions.

But what of the other feeling categories? What of surprise, anticipation, pride, hope, guilt, shame, or the feelings of nobility, courageousness, self-confidence, uncertainty, boldness, shyness, willfulness, arrogance, humility, remorse, reverence, or scorn? And there are quite a few more. Take a good thesaurus (especially 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 …" and see with how many terms you can complete the sentences.

Doing this myself, I have compiled a hopefully representative Big List of over 250 named feelings, following just 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 also others that 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 proper as I have just 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 in English.

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 these 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 such).

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.

27.2.6   *Evaluations: Meaning and Feeling*

What kinds of evaluative meanings are there? Somewhat surprisingly (and surprise is in fact one of them), it turns out that if we are evaluating states of affairs, happenings, events, or generally propositions (and mostly similarly for evaluating 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 and White 2005).

So what are these dimensions? They are: 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 really good 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 undesirable, but they are also felt as important, may be further evaluated as appropriate or inappropriate, most likely as unusual (though not always), and as 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 anger) to undesirable (irrational or uncontrollable anger); likewise regarding 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; 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.

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 8th 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.

27.2.7 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 various semiotic 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 relation to multiple semiotic systems (e.g., writing is both verbal and visual, speech both verbal and paralinguistic, etc.).
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 that is 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, and so on and on, just as in ordinary life.

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 previously 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 (Bakhtin 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 semiotic 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 coproduced with the meanings, and the kinds of meanings coproduced 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 of the sort being collected today in many social science and biomedical 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, 2013).

The work and value of semiotics as a science of how meanings-and-feelings come to be made on and across occasions seems to me to be greatly enhanced by taking the broad, bio-semiotic approach that I have advocated here. Further, developing both its foundations and its applications presents many opportunities for rewarding scholarship and, one may hope, for making our lived experience richer and more richly understood and our communities more just and better able to continue re-inventing themselves with meaning and feeling.

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