

Languaging as Emergent Constraint-satisfying Self-organizing Activity: Dialogical context-completing, context-making, and context-seeking dynamics¹

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Abstract

Languaging is a manifestation of intelligent human action that enables selves to seek and to co-articulate functional fits between self and selected aspects of the self's social and cultural environments. Selves have open-ended endogenous tendencies that strive for articulation in social situations. The final products of these tendencies – specific utterances – have functional capacities to enter into co-articulated relations with the other functioning components of larger-scale socio-affective-cognitive assemblages. Internal processes of microgenetic construction that have their origins in the pre-linguistic infra-structure of the self are corporeally schematized and entrained to and shaped by global order parameters, e.g., lexicogrammatical pattern. Intrinsic functional constraints on languaging activity are the work of a complex non-optimized system (the self) that draws on available resources in context-sensitive ways in order to yield social and cognitive outcomes. Infant proto-language is a guide to the emergence of these constraints.

Key Words: articulation, constraint, languaging, microgenesis, proto-language.

Résumé

Le langaging est une manifestation de l'action humaine intelligente qui permet à l'individu de rechercher et de co-articuler des correspondances fonctionnelles entre lui-même et certains aspects de son environnement social et culturel. Les individus ont des tendances endogènes ouvertes qui s'efforcent de s'articuler dans les situations sociales. Les produits finaux de ces tendances – des énoncés spécifiques – possèdent des capacités fonctionnelles pour entrer dans des relations co-articulées avec les autres composantes fonctionnelles d'assemblages socio-affectifs-cognitifs à plus grande échelle. Les processus internes de construction microgénétique qui ont leur origine dans l'infrastructure pré-linguistique du moi sont schématisés corporellement, entraînés et façonnés par des paramètres d'ordre global, par exemple un modèle lexico-grammatical. Les contraintes fonctionnelles intrinsèques de l'activité langagière sont l'œuvre d'un système complexe non optimisé (le moi) qui utilise les ressources disponibles en fonction du contexte afin de produire des résultats sociaux et cognitifs. Le proto-langage infantile apparaît comme un guide pour l'émergence de ces contraintes.

Mots clés: articulation, contraintes, languaging, microgenèse, proto-language.

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À Paolo Fabbri (17th April 1939 - 2nd June 2020), grande maestro della semiologia, che ha ispirato e catalizzato tante molteplici linee di fuga da esplorare³.

The chief error of psychologists: they regard the more indistinct idea as inferior in nature to the clear; but that which keeps itself remote from our consciousness and which is thus obscure, may on that very account be quite clear in itself. The fact that a thing becomes obscure is a question of the perspective of consciousness.

The 'thing which is obscure' is a result of the perspectives of consciousness, and need not be something inherently 'obscure'.

NIETZSCHE, Friedrich (2017). *Consciousness* (528), *Book III, Part I: The Will to Power as Knowledge, The Will to Power*, 306-307.

1. Introduction

The identity of utterances as well as any regularities in a given population of utterances need to be accounted for in terms of the individuation processes that historically generated the utterance. Moreover, any formal or other regularities of utterances must be accounted for in terms of an immanent semiotic structure rather than the external imposing of a form on a shapeless and meaningless matter, or the associating or combining of a form with a meaning. Utterances and their regularities of pattern are produced and responded to by selves. Selves have open-ended endogenous tendencies that strive for articulation in social situations. Moreover, the final products of these tendencies — specific utterances — have functional capacities to enter into co-articulated relations with the other functioning components of larger-scale socio-affective-cognitive assemblages. Assemblages are characterised by the fact that the component processes that contribute to the formation of the assemblage are not homogenised to the whole. Instead, they retain their relative heterogeneity as functioning components in the whole rather than being homogenised to it (DeLanda, 2010).

The first tendency — the striving for articulation of an initial pre-meaning or feeling-meaning that has its origins in the unconscious core self — was identified by Werner and Kaplan as a dynamic process of 'corporeal schematization' (1984/1963: 17-25). The first tendency is concerned with the internal processes that prepare and ready the self for interaction with the environment. The second tendency — of the final product to function in larger-scale assemblages — yields a final product (e.g., the phonetically or graphically actualized utterance) that tends to hide the intensive form-creating microgenetic tendencies that gave rise to its actualization. By the same token, the final product will possess both a well-defined set of extensive properties and an open-ended set of functional capacities to interact with and to form co-articulated relations with the other component processes of a given assemblage. The final product is a functionally organised action structure that serves to co-articulate selves to their environments. Human selves are the originators and producers of utterances. By means of their languaging activity, they have the capacity to interact with other individuals — human and non-human, animate and inanimate. They have the capacity to participate in and thus to form assemblages of ecosystemic relations, to play a role in complex social arrangements that may be distributed across diverse times, places, and persons and in directing its flows of matter,

³ I dedicate this article to Paolo Fabbri. Paolo passed away on 2nd June 2020 in Rimini aged 81 during the final stages of the preparation of this article. Paolo supervised my postdoctoral studies in the Istituto di Discipline della Comunicazione e dello Spettacolo at the University of Bologna in 1984-85. I would like to honor Paolo as a brilliant semiologist and friend who generously supported my research collaboration with him. Paolo was a cardinal figure in the shaping and development of my scientific career.

energy, and information. In other words, in and through their languaging activity, persons have the capacity to affect other individuals of all kinds and to be affected by them.

We perceive the affordances of utterances at the same time that utterances specify ways of orienting to aspects of the affordance layout of the situations in which they are functionally and constitutively embedded. Chemero argues that «events are changes in the layout of the affordances in the animal-environment system» (2009: 148). Utterances are time-extended structures of action produced, for example, by speakers' vocal tract and related gestural activity. The articulatory and phonatory dynamics of vocal tract activity enact changes in the vocal tract activity that are perceived as the affordances of that activity. Moreover, utterances are perceived to relate to situations; they make available information that provides indications about the situation rather than the utterance itself. Language is continuous with and a further extension of action and perception rather than something radically different from it (see also Hodges, 2007: 599-600). Languaging enables languaging agents interactively to constitute forms of virtual experience that extend action and perception. The many aspects of linguistic meaning are in my view better explained in this way.

Secondly, whereas meanings as standardly discussed are seen as intentional but non-phenomenological outcomes of the processing of experience into a symbolic form, I seek to maintain the link between languaging, the way languaging is experienced via the language stance, and how languaging affects our experiencing of the world. On the short time scales of languaging activity, the persons who participate in this activity co-explore and co-perform (Stuart & Thibault, 2015: 127-128) each others' utterance activity. For example, they explore by means of their sensorimotor skills and capacities the affordance layouts of the utterances they encounter in the flow of the languaging activity between two or more persons in, for example, a conversation. This real-time exploratory activity modifies the affordance landscape and in so doing it alters what Chemero (2009: 152) calls the «phenomenological-cognitive-behavioral niche» of the agent(s). The agent's activity alters the affordance layout, in the process the detected changes to the affordance layout feedback to and affect and change the agent's experience, including the development of its ability to perceive and act (Chemero, 2009: 152). The development of these skills and abilities further alters and extends agents' phenomenological-cognitive-semiotic niches.

In this paper, I outline a view of languaging as action for operating on and transforming social realities (Bickhard, 1987). The linguistic pattern that languaging selves learn to articulate and to perceive in their own and others' utterances is the phenomenological manifestation of 'formal' regularities that we actualize and perceive as wordings in languaging activity. A wording is not a formal entity. Following Cowley (2011), wordings are nonce events; they depend on how we experience the event on a particular occasion on the basis of our prior experience of such events in a particular population of languaging agents. Wordings are a particular, culturally developed way of experiencing utterance-activity. It is on another level that a particular wording that is experienced in a particular utterance on a particular occasion is construed as an instance of this or that lexicogrammatical category. In order for a particular wording to enter the epistemic domain as an instance of this or that lexicogrammatical category there must also be a higher-level experience of a particular wording as being an instance of the category in question. The phenomenological basis of our conscious awareness of wordings means that wordings have the capacity to affect us in culturally salient ways, including the capacity to evoke forms of extended action and perception that are not tied to the here-&-now of direct perception (Thibault, 2011a; Verbrugge, 1977). Wordings are the concrete manifestation in languaging of intrinsic functional constraints on the operation of languaging as action system. I develop this point in detail below.

2. Four General Semiotic Constraints on Languageing

Deacon (2003) points out that the semiotic freedom of symbol tokens is constrained by the fact that a symbol must be bound to an index that is linked to some external locus — the non-linguistic experiential topology of things, events, causes, times, places, etc. — on which the index is dependent. This dependency relation is necessarily local in character. That is, it must be anchored in and retrievable from the currently active part of the experiential topology that the utterance is perceived to activate. Deacon's discussion is mainly focused on the referential relationships between utterances that are grounded in relation to the objects that they are bound to in physical space. However, the deictic functions of utterances are more multifaceted than the referential relationships that form the core of Deacon's account. For example, when I exclaim « ouch! » in response to being burnt by a hot object or surface that I touch, my interjection is linked to a specific location — the hot surface — in the currently active experiential topology in this sense. The interjection is also the expression of an affect in relation to the property of the object that causes the experience. The interjection is prompted by a material context that requires my quick withdrawal from it, for example, when I pull my hand away while uttering the interjection. In the interjection, my response action, the interjection, and perceptual and affective meanings are fused as a relatively undifferentiated whole.

The primary impetus or motivation for languageing is the striving on the part of concrete living persons, not abstract speaker-hearers or sender-receivers, to complete (some aspect of) the local context that is understood to be currently activated. The term local is not restricted to perceivable material context though it can include that. Rather, the term local refers to the particular contextual conditions that are activated by an utterance at a particular location in the experiential topology. If I tell you that I will drop by the green grocer's on the way home from work to buy some apples and bananas, my utterance points to and indicates buying apples and oranges at the green grocer as the particular location in the experiential topology that is currently activated. My utterance is thus locally tied to that place in the particular part of the topology that my utterance activates. Any further utterances on the same topic are dependent on that context for their functioning. They function locally in and are locally tied to that context. There is no need for the green grocer's shop to be materially present though of course in another context such as that of buying and selling fruit, my utterances and those of the greengrocer will in many respects be tied to aspects of the material context.

For example, if, when I visit the green grocer's shop, I say to the greengrocer, « Can I have three bananas, please? », my utterance is a conventional operator that is locally dependent on the presence of the fruit and vegetable shop as one of its contextual conditions. By the same token, the utterance also differentiates the contextual conditions required for other utterances and actions to occur. My utterance is both dependent on the material context at the same time that it sets up the contextual conditions on which the subsequent interaction flow is dependent. In each case, the local functioning of utterances in their contexts means that utterances are indexically tied to and dependent on the contexts that they evoke (create), or to the context that they are dependent on, as shown below:

1. context-creating utterance > evoked context;
2. context > context-dependent utterance.

Context may include the material context, non-linguistic actions, and so on. It may also include other utterances. These local dependency relations are aspects of context completion. This striving for contextual completion means that the constraints that give rise to our experience of linguistic pattern have concrete effects in the world that can be linked to the context that is locally evoked and locally accessible in the interaction. That is, they are linked to the context

that is currently understood to be in operation. In other words, they must be accessible in the situation that is apperceived to be currently activated. Moreover, we do not impose meaning on a meaningless external world. The world we live in is already alive with meaning and value. The world imposes its own selection pressures on language form and function. Through languaging people operate on and seek to change selected aspects of the « interworlds » (Linell, 2009: 160; section 6) that they co-create in concert with others in their languaging activity. These constraints are selection pressures that contribute to the emergence of linguistic form. Utterances are forms of action that serve to co-articulate relations between persons and selected aspects of their worlds. Languaging is a highly articulated mode of action that, like all action systems, is functionally constrained by its intrinsic functional character.

As the transition from infant proto-language to language shows (Halliday, 1975; Thibault, 2004a: chap. 3, 2005a; section 3 below), the emergence of lexicogrammar constitutes the development of and provides support for the capacity of persons to participate in languaging qua action system and thus to co-articulate functional relations between persons and selected aspects of their social worlds. For the purposes of the present discussion, in this section, I propose four general semiotic constraints that help to explain the emergence of different aspects of language form and function. The four constraints are different facets of an immanent abstract semiotic structure that supports the emergence of both the functional capacities of social agents to participate in dialogically coordinated languaging and the intrinsic functional organisation of languaging that enables and scaffolds agents' capacities. The four constraints affect in different ways the relationships between different aspects of the linguistic pattern or structure that people perceive in utterances. The four general semiotic constraints are as follows:

1. The positing of an utterance that seeks to elicit or to anticipate potential responses from others. Utterances are structures of action that, in common with all forms of action, create a modalised field in which the utterance anticipates future interaction potential. Utterances anticipate others' responses that complete and contribute to the further development of the meaning of the utterance-situation matrix;
2. The semiotic requirement that utterances thematise a locus of orientation and attention that is retrievable in the currently active experiential topology;
3. The semiotic requirement that the utterance points to (indicates) and differentiates the selected locus of attention as that which the utterance is about;
4. The semiotic requirement that the utterance is in some way dependent on contextual relations, or is the means of setting up and creating contextual dependency relations, that are available in and therefore retrievable in the local context.

In the following section, I tie these observations to the transition from infant proto-language to language in order to show how exogenous selection pressures deriving from the infant's increasing differentiation of situations dialectically inter-penetrates with endogenous dynamics to give rise to self-organising form-creating tendencies in response to changing selection pressures in the child's social world.

3. Emerging Lexicogrammar in the Transition from Infant Proto-language to Language

In his paper, *On language in relation to human consciousness*, Michael Halliday (2003/1995: 400-403) describes how the transition from the child's proto-language to the mother tongue is epigenetically dependent on « the social-semiotic construction of the self » (2003/1995: 400). A fundamental aspect of this process is the transition from a meaning system that has a

phonetics and a semantics, but no lexicogrammar (the child's proto-language), to a system that has a lexicogrammar (the mother tongue). It is worthwhile quoting at length the following analysis that Halliday provides of this process:

How does the grammaticization of the system of meaning come about? The strategy seems to be the fundamental principle of semogenesis, namely that of decoupling -- the dissociation of associated variables. This can take place in many different contexts; here is the instance I first observed, a few days after the child in question had taken his first steps in walking. He had at the time, as part of his protolanguage, three signs that had become specialized to the three people in his meaning group, 'mummy', 'daddy', 'anna'; these were not yet referring, but were person-specific interactional, and were said always on a high level tone (not used in other expressions), as in Figure 3(a). Within a period of two or three days he construed this system and reconstrued it as in Figure 18.3(b). The person-specific signs have now become names, while the interactional component has been grammaticized as a modal opposition of greeting (acknowledging presence) or seeking (overcoming absence). In other words, the child now has a proto-grammar consisting of two systems, one realized lexically, the other phonologically: the two systems are dissociated, hence freely combinable, and each utterance must select in both. In the event, it was another three months before the child followed up this development; but in this one move he had underpinned a semiotic of a fundamentally different kind. This is the semiotic that embodies Edelman's "higher-order consciousness"; it has a new and distinctive kind of network, a lexicogrammar, at the core. (If the form of a grammar was genetically programmed, why would children first construe a semiotic of another kind, in which there is no trace of the grammar at all?) (Halliday, 2003/1995: 402).

Halliday's person-specific interactional system (his Figure 3a) and the new system, consisting of the naming and modal systems (his Figure 3.b) are shown in Figure 1.

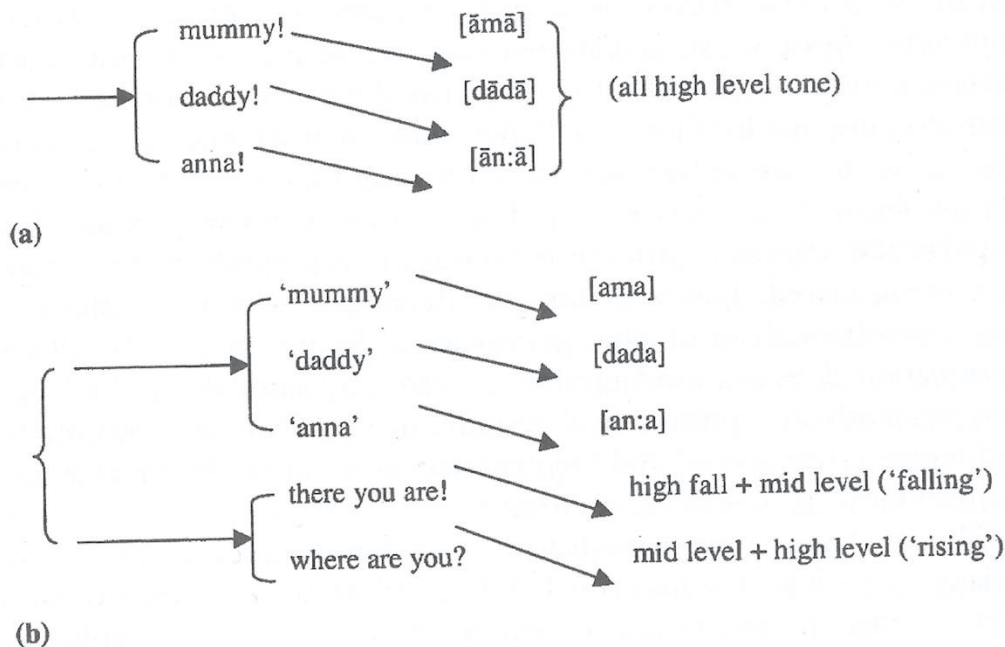


Figure 1: Halliday's person-specific interactional system (his Figure 3a) and the new system, consisting of the naming and modal systems (his Figure 3.b); Halliday (2003/1995: 403)

Halliday's account retains the idea that the emergence of lexicogrammar in the child's transition from proto-language to language can be explained in terms of the ways in which the three signs in the person-specific interaction system can be re-combined with the two phonological tones in the modal system. This assumes that the terms in the two systems are independent variables that can be brought into new combination. As Halliday's discussion shows, this is based on the assumption that « language » is a system of forms and meanings that can be combined and recombined in variable ways. Such an account is not compatible with the microgenetic account developed in the present paper. According to the latter account, both ontogenesis and microgenesis, albeit on very different time scales, involve the morphogenetic progression from less differentiated to more highly differentiated formal arrangements.

Halliday is right to pose the question he does at the end of the paragraph quoted above. Rather than starting with a genetically pre-programmed grammar, the developmental transition from proto-language to language is a diachronic emergence in which the later system bears traces of the vaguer antecedent system, which is contextually integrated to and reorganized by the later emergence of the “adult” system. Just as the earliest forms of dyadic communion between infant and caregiver are based on the co-synchronization of rhythmic patterns and prosodies of affect and arousal that are integrated to and re-organised by the emergence of the “adult” system, in the microgenesis of an utterance, antecedent phases of rhythmic synchronization and affective prosodies are progressively differentiated *from within* as full-fledged linguistic structures under the guidance of both internal and external selection constraints (section 5).

The three signs displayed in Halliday's Figure 3a are cue-specific; they take place in a specific context. There is strong coupling between the three terms and the use of the high level tone in all three cases. The three signs are « person-specific interactional » (2003/1995: 402) and are « specialized to the three people in his meaning group, ‘mummy’, ‘daddy’, ‘anna’ »; (Halliday, 2003/1995: 402). There is tight coupling between each sign and the person with whom the child interacts with that sign. The decoupling of articulation from intonation, the grammaticalization of the interactional component as « a modal opposition of greeting (acknowledging presence) or seeking (overcoming absence) » (Halliday, 2003/1995: 402), gives rise to a grammar consisting of the two systems described by Halliday— one realized lexically (the naming system) and one realized phonologically by the contrasting tones (the interaction system).

The newly emergent system yields an expanded set of functional differentiations and their possible combinations in the form of the systems of the new, more complex higher-order informational invariants that are obtained by the combination of a selection from the interaction system with a selection from the naming system. In this way, names can be modulated in the two ways shown in order to enact the attainment of a desired goal. However, this does not mean that names at this stage afford the ability to reflect on names. That comes later. At the present stage, as described by Halliday, names and their modulation by tone afford action in relation to the person named.

For example, the sign /dada + falling tone/ can be glossed as Greeting Daddy; the sign /ama + rising tone/ can be glossed as Seeking Mummy. Halliday writes that the emergence of grammar is the slotting in between the phonetics and semantics of the prior proto-linguistic system of a new, more abstract *intermediate* level of organization. Halliday's formulation gives the impression that the new system is abstracted from the phonetics of articulation and intonation, respectively. I would rather say that the decoupling of the articulatory and intonational components of the prior system, the differentiation of the latter into two contrasting options (falling vs. rising tone), and the potential for the recombination of selections from the naming and interaction systems, constitute a re-organization of the phonetics along functional lines, not its transcendence.

The lexicogrammatical pattern that is detectable in phonetic gestures is only more ‘abstract’ in the sense that it yields high-order compound physical invariants resulting from combinations of lower-order ones. However, these are always organizations and re-organizations of the material dynamics— organizations of patterns of process that the infant learns to attend to, articulate, and value. The further point is that the newly emergent component parts and their re-combinations act back on and constrain the dynamics of the smaller scale phonetics. In this way, functional information for the Person-Utterance-Situation Interaction System arises from a re-organization of the physical properties of phonetic gestures instead of being mapped onto the gestures as an additional level of abstract ‘form’.

The new system shows the rudiments of a system that affords both robust tracking of aspects of agents' worlds across persons, times, and places without being tied to the here-&-now and the attainment of the agent's goals. The child's sign both differentiates a functional position in the topology — one of the persons he can name in his meaning group — at the same time that he coordinates an action — greeting or seeking — in relation to that person. The combination of these two possibilities in his sign-making is in accordance with the two subsystems that constitute the control mechanisms of the human folk-psychology: robust tracking and goal-directed representation.

Language is a flexible and adaptive resource that enables what Sterelny (2003: 27-29) calls *robust tracking*. Robust tracking makes use of decoupled representations. The latter enable the agent to track aspects of its world without being tied to specific behaviours. The emergence of a naming system affords the tracking of the three persons across a more diversified set of situations. The ability to name means that the self has a more robust system for recording memories and for calling up memories. The robust tracking of aspects of the things named in the self's world brings in the arrow of time. The robust tracking of entities through naming develops a history. Naming has a direction that can be recorded in time as each new mention of the thing named accumulates historical information. Names and the robust tracking they afford mean that time becomes an observable. Things named can be evoked as past memories or placed in imaginary futures. Imaginary things can be named. By the same token, the naming system is no longer tied to a single type of action, but is potentially relevant to the two types of action — greeting and seeking — described by Halliday. There is a further important aspect of the developmental emergence that I will now discuss.

The emergent modal distinction between *greeting* and *seeking* that is realized by the contrasting intonational patterns means that the environment of the child is now perceived to be more translucent — the persons who can be named may be present or absent from the purview of the child. The intonational modulation of the names means that the choice between ‘falling’ and ‘rising’ tones now affords the child the capacity for what I will call modalized exploratory activity in order to elicit a response from his environment has been expanded. The potentiality of the three persons in his meaning world to be either present or absent means that the child's world is now more fluid, more unreliable, more translucent.

The new system extends the agency of the child. It is important to bear in mind here that the various signs described by Halliday are dialogical acts. They are enacted in the child's engagements with the others in his meaning group. It is through these exploratory acts performed in concert with others that the child gains a felt sense of his own agency -- his power to respond to others when they appear and to summon them to appear when they are absent. In other words, he discovers that modulating the act of naming a person (and later different objects) by controlling the intonational shape of the utterance can change his phenomenal experience. He learns that naming coupled to greeting or seeking is a class of operation on the relevant situation that has the capacity to bring off a particular class of situation transformation

together with the transformation of experience that this entails. He thus learns to control the contentfulness of experience and to draw on a history of such regularities so as to evoke this content in his situation-transforming utterance-activity.

Unlike the prior proto-linguistic system, which featured strong coupling of sign to person in the presence of that person, the new system is now more weakly coupled to the physical presence of the person named. Perception of the person in the child's immediate purview and action are now starting to become decoupled. The recoupling of the naming and interaction systems however has an important payoff. The naming of a particular person indicates from the standpoint of the child a particular functional focus of interest and hence of value. If, for example, Daddy is absent and the child creates a sign of the type /dada + rising tone/, meaning Seeking Daddy, then the child is interactively constituting Daddy as the functional locus of a preferred course of action. This decoupling goes hand-in-glove with a further decoupling -- that of intrinsic affect from action. Whereas the prior, proto-linguistic system is motivated by the infant's intrinsic, biologically grounded motivations such as hunger, thirst, tiredness, pain, pleasure, discomfort, need for company, feeling too hot or too cold, etc., etc., the new system decouples intrinsic affect from action. Increasingly, the ability to name goes with the ability to produce hypotheses and to anticipate possible outcomes in the imagination that can be preparation for action, or which can be tested in (future) action.

Biologically intrinsic motivations are increasingly dampened without of course being altogether cancelled from the picture. If I feel thirsty, I can still ask for a glass of water! Intrinsic motivation of this kind is integrated to and reorganized by a system of cultural motivations, norms and values as the child progresses into the adult tongue. The newly emergent system described by Halliday enables Nigel interactively to explore and change his world in the way indicated by the person who is named in his utterance. If Daddy is absent and Nigel wants Daddy to be present, he can say /dada + rising tone/ in order, hopefully, to elicit the desired response from the environment. The emergence of the distinction between the modal values 'greeting' and 'seeking' gives expression to a form of motivation that is shaped by culture as distinct from the intrinsic biological motivations that played the dominant role in earlier stages of development.

In the proto-linguistic system, the three signs in Halliday's analysis are indexically tied to environmental actualities that are already given in advance. The three proto-linguistic signs relate to specific aspects of the child's interpersonal environment and the child's relations to them. The selection constraint in each case is the presence in the environment of the person in question. The presence of the three persons is part of the structure of the child's world as are their comings and goings in the course of the child's daily life. The presence or absence of the three persons at any given moment constitute departures from randomness that elicit a proto-linguistic response from the child. In the first (proto-linguistic) stage discussed by Halliday, the selection of the three signs, all on high level tone, is constrained by and dependent upon the presence of the particular person, who constitutes an occasion of interaction potential for the child. The selection constraint is simply stateable as follows: THE OCCURRENCE OF THE CHILD'S MOTHER IN THE CHILD'S ENVIRONMENT PROMPTS THE CHILD TO UTTER THE SIGN /dada + HIGH LEVEL TONE/.

The sign is an elementary operator that operates on and is contextually dependent on its argument, i.e., the availability in the environment of the mother as a potential interaction partner. In contrast, the later emergence of the expanded system shows a self-organising dynamic at work that de-couples the person-specific interactional signs from the high level tone and recouples them to an expanded set of possibilities that yield different couplings of meanings from two distinct paradigmatic sets, i.e., (1) the names of the three persons; and (2)

the tonal distinction between « high fall + mid level ('falling') » and « mid level + high level ('rising') », indicating a modalised stance on the presence or absence, respectively, of the person named. In this case, the tone selected is a modal operator on the name.

The earlier system was closely tied to particular aspects of the structure of the child's world. Its three options are responses to the particular aspect that they indicate. Halliday glosses the three signs as « person-specific interactional » (Halliday, 2003/1995: 402). In each case, the presence of the particular person affords possibilities of interaction with him or her that constitute elementary forms of context-completing and context-making. The child's three person-specific proto-linguistic utterances are prompted by the presence of the particular person at the same time that they seek to extend the interactional context with that person. The child's utterance in the presence of that person has the potential to elicit further interaction.

On the other hand, the expanded system with its possibilities for combining and recombining the naming and modal systems described by Halliday, means that the child now has expanded possibilities for *creating* information about the world. The co-occurrence structures of the newly expanded system are probabilities of co-occurrence of linguistic structure that enable the child to create information about his world that is not directly tied to the probabilities of co-occurrence of things and events in the world, on the one hand, and the child's proto-linguistic utterances, on the other. The self-organising dynamics of the newly expanded system enable the child to create information about things and events that are not necessarily present. Whereas the earlier system is a modal response to the presence of a specific person, the later system is not dependent on fully realised presences in the world. Instead, the later system provides the child with an expanding set of modal capacities and concomitant viewpoints that enable him to explore and seek to actualize the virtual potentialities of the world.

For example, in saying /*ĀMĀ* + HIGH LEVEL TONE/ ('where's mummy?'), the child is not referring to an already given presence consisting of fixed properties or essences that that the sign names or 'stands for'. Instead, the child is seeking to guide and to actualize a process of context-making which his utterance posits and differentiates. The absence of his mother in the situation motivates languaging that seeks to make her present and thus to complete or fill in a felt lack in the material context. The information-creating capacities of languaging mean that it has the capacity to individuate things and events which are not given in advance and which are not already included in the utterance that initiates this process--a process of actualization and individuation of the virtual potential of the world. The utterance /*ĀMĀ* + HIGH LEVEL TONE/ ('where's mummy?') does not yield some set of pre-determined possibilities. Rather, it functionally constrains the activation of trajectories of becoming that constitute the further development of the meaning potential of the utterance. How the world, including other persons, responds to the child's utterance are not pre-given in advance. The utterance is a modal exploration of some aspect of the virtual potentialities of the world. These potentialities may be actualized in a plurality of ways that are functionally constrained and/or enabled by the utterance though they are not determined by it.

The two terms in the system of tone in Halliday's example are modal values that deictically point to the completion or resolution of the local context (high fall + mid level ('falling'), on the one hand, or to the anticipation of its future development (mid level + high level ('rising'), on the other. For example, the utterance /*dada* + falling tone/ is a modal response to the presence of the father in the local context. The presence of the father is the material contextual condition that prompts the utterance and on which the utterance is dependent. The child's dependent utterance completes the local context. The falling tone in the child's utterance points to and evaluates the father's presence as a resolved or complete local context that presents

opportunities for further interaction. The child indicates his father to be close by and able to satisfy his needs.

On the other hand, the utterance /dada + rising tone/ deictically points to the father's absence or distance from the local context at the same time that it articulates the modalised desire for the contextual completion of the local context in the form of the father's presence. Rising tone evaluates the local context as incomplete and in need of completion. It is a modal operator that articulates an anticipatory dynamic. It anticipates and seeks the completion of the context at some future stage. It articulates an unresolved contextual tension that requires resolution and therefore the restoration of contextual harmony. In this sense, rising tone in the utterance indicates context-seeking. It is deictically oriented to the seeking, resolution, and completion of the given local context -- the absence of the father -- in the future. In the child's newly expanded system, the two tones function as modal operators that modulate the three names in the child's system for interactional purposes at the same time that they deictically point to the child's felt closeness to or farness -- physical and interpersonal -- from the person who is indicated by the utterance.

The four general semiotic constraints proposed above can be seen as selection pressures on the child's utterances as follows:

1. The utterance posits an affectively charged modalised view of relations of felt closeness to or farness from the important persons that he interacts with in his daily life. For example, the falling tone in /dada + falling tone/ deictically specifies the father's physical presence in the material context as a perceptual and affective closeness that provides an occasion for interaction with him. The child's utterance is an operation on this field that seeks to modify it in some way, e.g., getting the father's attention and engaging in interaction with him. The utterance thus serves to connect the child to his father by means of a modally charged interactive stance that has the potential to be taken up by the father and acted on. This possibility is constrained by and is dependent on the ways in which the participants in an interactive encounter have properties and motives that are only partially apprehended by others and which depend on the fact that the different persons who interact do so with reference to their respective viewpoints, which are deictically anchored to their embodiment. For example, if the child thinks his father will engage with him when he says /dada + falling tone/ then this expectation, which is an implicit modal value, has the potential to shape the situation between them. Their different perspectives, together with their different wants and needs, are selection constraints that give rise to an interest in coordinating their viewpoints in order that they can satisfy the constraint that they develop a dialogically coordinated solution to the problem of reaching a shared understanding;
2. The utterance thematises a locus of orientation and attention that the utterance is about. For example, /dada + falling tone/ thematises the presence of the child's father in the local context as the current locus of orientation and attention;
3. The utterance /dada + falling tone/ differentiates 'dada' as distinct from 'ama' or 'an:a' as the current locus of perceptual and cognitive processing. The three terms specify different locations in the emerging experiential topology. The utterance /dada + falling tone/ points to a given location in the currently active experiential topology and differentiates it by selecting 'dada' rather than either of the other two terms. The selection of 'dada' is not an encoding of the father's presence, but an indication as to which part of the topology is currently active and is to be attended to. It functions not by encoding a

current actuality, but by differentiating or partitioning the topology in contextually relevant ways;

4. The utterance is dependent on the given local contextual condition — the presence of the father — in order for it to occur. Consider the relations between the contextual conditions specified below and their respective utterances: 1. material context: presence of father > /dada + falling tone/ > contextual completion > opportunity for further interaction in the present; 2. material context: absence of father > /dada + rising tone/ > anticipation of desired future contextual completion > opportunity for further interaction in the future. In both cases, there is a dependency relation between the child's utterance and the material context that motivates the utterance. The material context — presence or absence of father — differentiates the local conditions that are required for one or other of the two utterance types to occur. These relations of dependency must occur *locally* if the relevant conditions are to be satisfied. In both cases, the child's utterance is an operator on its context that is locally dependent on a particular contextual condition for the utterance to function. Moreover, the particular contextual condition must, at the time of utterance, hold at a particular location in the overall topology. This requirement of unique contextual location and its accessibility is therefore a selection constraint on the utterance and its formal organisation. In each case, the particular contextual condition — the presence or absence of the father — is a context-creating operator on which the utterance is dependent. In the adult language system, utterances may themselves function as the contextual conditions that are required for other utterances to function. In such cases, the dependency relation is between utterances. For example: *Manure is best dug in when it is rotting*. The second clause *when it is rotting* is a temporal operator that specifies the contextual condition that must be satisfied for the action indicated in the first clause, *Manure is best dug in*, to occur. In this case, the sentence, which occurred in a book on growing vegetables, is a virtual rehearsal of an activity that can be potentially actualized in some material context. The virtual potential of the utterance therefore anticipates its integration to and actualization in material contexts when the relevant contextual condition applies. Circumstances, whether expressed adverbally or clausally, as in the example, are local constraints on the situation that is indicated by the utterance.

Halliday's argumentation relies on the idea that independent variables are 'combined'. This way of thinking derives from associationistic psychology (section 7). Instead, I argue that the transition that he documents arises from the dialectical inter-penetration of endogenous and exogenous factors. The striving from within to articulate an increasing range and diversity of relations between self and its 'objects', on the one hand, and the increasing demands of an increasingly complex and mobile context, on the other, select for increasing differentiation and integration. The self strives to co-articulate to its contexts and their objects by means of its utterances. In the initial system described by Halliday, the child's three person-specific interactional signs are contextually dependent on the presence of the person in question. Speaker, utterance, and the presence in the local context of the given person are relatively undifferentiated facets of a single global configuration, or utterance-situation matrix. In time, the child is more aware of and attuned to the comings and goings of the three persons. The context is increasingly mobile. At times, his father, for example, is present; at other times he is absent. This contextual dynamism is a selection constraint that selects for the differentiation of these two different situations — presence or absence of the person — *and* the differentiation of the child's stance with respect to the situation. I return to the second point below.

The three signs in the new system, [ama], [dada], [an:a] are now called upon to provide information that is constituted by the utterance itself rather than being redundant with

information available in the material context, i.e., the physical presence/proximity of the three persons in the child's world. The three signs no longer function as indexicals that are contiguous with the given person in the material context though of course they can still also have this function. In the new system, they have the increased information-constituting capacity to evoke and make present in the imagination a person who is not physically present. In the Seeking mode, they articulate a desire to complete a material context that is incomplete. The internal re-organisation of the child's languaging and the building in of more and more intrinsic functional constraints is in response to the felt need on the child's part to fill in the context or to seek its completion by linguistic or other means.

Secondly, the modulation of these person-specific signs by the two phonological tones that now arise in the child's system is in response to the contextual need to specify an expanding range of interactive stances and their associated modal expectations. The possibilities of modulating vocal tract action are accordingly expanded and re-territorialized as the child explores new social possibilities. Again, the two tones are differentiations from within that are selected for by constraints and requirements arising in the expanding and increasingly mobile context of the comings and goings of the persons in the child's world. They are modal stances of a self whose objects are expanding and diversifying, thus requiring an increasingly differentiated and articulated range of responses of the self.

The child's utterances acquire additional intrinsic functional organisation. The information in the child's utterances is, as Harris well explains, not simply « an unordered collection of departures from equiprobability, but a specific structure consisting of one step acting on another » (Harris, 1991: 355). Thus, the system of the three person-specific names is a system of three operators that act on the material context of either the presence or absence of the person named. The system of modal stances specified by the two phonological tones operates on and modulates the shape of the particular name that is selected for specific interactional purposes (McGregor, 1997: 64-70). The name is an operator that operates on the material context. The tone is an operator that operates on the name and modulates its articulatory and acoustic shape. The resulting specific structure consists of a number of overlaid intrinsic functional constraints that together create a structure of information that has the capacity to complete or to seek the completion or resolution of the local context precisely because the utterance adds information that is not available from or reconstructable from the information in the material context, at least not from the child's perspective at this stage of his development.

Halliday argues that lexicogrammar is an intermediate level that arises between the situated phonetics and semantics of the prior proto-language. In my view, the key to understanding this dynamic lies rather in the social semiotic development of the *self* and its relations to its objects that Halliday mentions but does not develop as a significant line of argument, given his focus on the transition from the proto-language to language.

The three-level scalar hierarchy view developed by Salthe (1993: 36-52) in the field of developmental biology is a useful tool that helps us to think in a clear way about the different kinds of levels involved without pretending that the levels are neatly separable from each other. The middle level (L) is always the focal level. The choice of a focal level depends on the purposes of the theorist or analyst. The focal level is so defined because that is the 'object' or 'entity' that is the main concern of the analysis. The choice of focal level is therefore determined by the interests of the analyst. Level L is the focal level. Level L-1 refers to processes below Level L. Level L+1 refers to processes above the focal level.

Lower levels can be understood in terms of the way they are contextually integrated to higher levels in the hierarchy. Higher levels have emergent properties and processes that are not reducible to lower ones. Thus, meanings *qua* attractors in a possibility space – a semiotic

system – manipulate and entrain lower-scalar physical-biological processes to their own ends so that new configuration and arrangements of lower scalar processes and entities arise. These new arrangements are more highly structured and more highly specified with respect to the lower scalar processes such that the higher-scalar system is able to interpret lower scalar processes. The reverse is not, generally speaking, the case because lower scalar entities are not sufficiently structured to do so. Semiotic systems are therefore global meta-semiotic phenomena which range over and constrain local phenomena. For present purposes, the three levels are as follows:

Level L+1: The social semiotic environment of the child's interactions with the three persons distinguishes six newly emergent situation-types, i.e., the presence or absence of the three persons in question;

Level L: The child's utterances manifest new organisations of intrinsic functional constraints that serve (1) to acknowledge the presence of the person when that person is present, or to seek his or her presence when the person is absent; and (2) to modulate this expression of presence or absence with a choice of falling or rise tone that articulates a modal stance. The self in interaction with the three persons strives to respond to and to co-articulate the self to an expanding range of contextual demands. The child's utterances now build more of the context into his utterances;

Level L-1: The self in interaction with the three persons strives to articulate responses to the expanding range of contextual demands by re-shaping neural and bodily dynamics in new ways that enable him to co-articulate the capacity to name and to evoke the three persons with the capacity to modulate his interactive stance on them.

The social semiotic environment of the child in Halliday's account shows that many of the top-down (level L+1) constraints do not derive from institutional norms, but from levels of social semiotic organisation in, for example, individuals families and interpersonal dynamics that are too fleeting to be recognised as institutions, but which are, in many ways, far more effective in giving rise to situations and their associated selection constraints in the form of the child's relations with particular persons, the affective and relational dynamics that play out, and the expectations that are formed. Emerging situation-types and re-alignments of these on L+1 select for an expanded range of responses on Level L in the form of an increased repertoire of options for initiating and responding to the diverse forms of context-completion that arise. On Level L-1, body-brain dynamics are re-organised to yield persistent patterning. The self-organising dynamic at work means that interactions between and feedback loops across levels give rise to repeated iterations of feedback loops that are attracted to, honed by, and converge on a particular outcome. For example, the desire to seek the absent father is a regular situation type on L+1 that feeds back across level and embodies their respective inputs so as to give rise to a persistent pattern in the form of the modulation of the name /dada/ with rising tone. That is, the desire to seek the absent father is attracted to a particular interaction outcome on level L that is embodied in persistent body-brain patterning on L-1.

4. Language as Self-organising Activity: Internal to External Constraints

The three persons are part of a non-linguistic social reality that afford the child occasions for interactive complexity that lead to the emergence of social realities that languaging operates on. The presence or absence of the three named persons on any given occasion are aspects of emergent social situations that utterances operate on and seek to modify. The child, through his utterances in Halliday's account, both operates on and transforms these social realities as well as further constituting them. The presence or absence of the three persons provides an

expanding range of possibilities for languaging that the child, in concert with the persons in his life, can interactively explore and develop together.

Languaging is an (inter)action system for operating on social realities (Bickhard, 1987). The child's transition from infant proto-language to language shows that whereas many of the selection constraints in the proto-language derive from the local material context on which the child's utterances are dependent, the transition to the adult language system entails more and more layers of multiple and overlapping intrinsic functional constraints on what operations can be performed, when, in what order, and so on (Halliday, 1975, 1979; Martin, 1991). The possibilities for the child's participating in structures of (linguistic) action and interaction are intrinsically constrained by the functional character of the action systems themselves, including language.

In the first instance, many of the constraining and enabling factors that affect and modulate the child's proto-linguistic utterances exist in the internal and external material context such that the child's utterances seek to satisfy those constraints. With the transition from proto-language to language, the material context does not go away or cease to be relevant. Rather, the relationship is re-organised. More of context is built into languaging, meaning that more and more constraints become functional constraints that are intrinsic to the internal organisation of language itself. The emergence of 'lexicogrammar' is, then, the means by which the infant proto-language is re-organised as the adult language by virtue of the ways in which many of the external functional constraints necessary for the proto-language are now integrated to the newly emergent lexicogrammatical layer of organisation and re-organised as intrinsic functional constraints on languaging as (inter)action system. In this way, languaging becomes a fully-fledged context-completing, context-making, context-seeking mode of (inter)action. This view contrasts with the idea that the relationship between language form and meaning is arbitrary (e.g., Cattell, 2007/2000: 207; Saussure, 1917/1915: 100-102; Yule, 2006: 10), or that it is motivated by the sign-maker's interests (Kress, 1993).

Languaging selves, like all living systems, are not passive systems that act only when acted on by internal or external causes. Languaging, like all human mental activity, goes on intrinsically in the central nervous system even when this 'inner' activity is not manifested as observable bodily activity. This internal activity is in the form of processes of microgenetic preparation and set up that maintain the person in a constant state of readiness for action in the world when required. Microgenetic processes are therefore functional in the ongoing recursive self-maintenance of the person. In modulating the person's inner and outer activity, they prepare the person for interactivity with the external environment and maintain the person in a state of readiness. Microgenetic processes set up and constitute internal conditions and constraints on languaging (and other) activity. These processes maintain the brain's function stability and coherence. Even when there might appear to be no overt interaction with the external environment, person-environment or self-object transactions are constantly taking place as endophasic and exophasic activity. The brain does not 'represent' an independent external domain. The self-object or self-nonsself duality and its co-articulation is primary and fundamental, not derivative. This means that the self does not exist without its object and the self's objects don't exist without the self. The two exist in a condition of constant co-articulated symbiosis. The infant is born with its virtual other and « associated companion space complementing her bodily self » (Bråten, 2013: 18) that, as Bråten explains, can be filled with actual others in relations of felt immediacy thereby enabling and sustaining the co-articulatory dialogic dance between self and its objects. Microgenesis goes on incessantly as background activity in the brain that keeps this dialogic dance going as the fundamental duality of mind process.

These internal conditions and constraints include affects, experiential memories, feelings, dispositions, desires, and values. External conditions include situational, social, and cultural factors. These conditions — internal and external — serve as constraints on and modulations of the dynamics of self-organising languaging activity. The four semiotic constraints outlined above constitute selection conditions that modulate emergent languaging activity. Languaging activity involves the striving for articulation in social situations of pre-linguistic, more global and less differentiated feeling-meaning. The self-organising character of this activity manifests implicit properties, tendencies, and capacities of the dynamics of the system that become more and more visible as formal arrangements and regularities as the system dynamics are expressed through multiple iterations and their concomitant production processes on the scale of an entire population of languaging selves in a given community. The concept of attractor in complex systems theory is thus used to express how these implicit properties and tendencies are manifested, over time, as emergent language forms and the functions they serve. Self-organising languaging activity and its emergent 'formal' regularities are in accordance with both internal conditions that are set up by microgenetic processes and by external semiotic constraints of the kind outlined above.

These constraints do not and cannot specify every fine-grained detail of utterances. Instead, the relationship between these general constraints and languaging activity is one of dialectical inter-penetration rather than the interaction of covariates or independent variables. Languaging is time-extended emergent activity in which the detail is filled in by specific selections from repertoires of options. Utterances have their microgenetic origins in more wholistic pre-linguistic structures of feeling-meaning. These holistic structures constitute a more global, less articulated and less differentiated situation-utterance nexus that is progressively differentiated and articulated as an utterance in relation to its situation.

Internal and external conditions and constraints dynamically inter-penetrate each other. Utterances are energised and animated from within by living persons as much as they are constrained by external factors. The utterances and other forms of action that derive from the inter-penetration of internal and external constraints and conditions orient to and seek to actualize these constraints in ways that are manifested in the formal organisation of emergent languaging (and other) activity. Unlike theories of the sign based on associationistic psychology, languaging is not a system for pairing forms with meanings. Languaging is a constraint-satisfying activity whereby languaging selves seek to orient to and to articulate the internal and external selection constraints and conditions in ways that are actualised in dynamic form-creating (morphogenetic) processes that give rise to emergent language form and function.

5. Emergent Intrinsic Functional Constraints and Linguistic Patterning in an Utterance: Analysis of an Example

In this section, I focus on the utterance as a unit of interaction rather than on formal units or abstracta such as the sentence. Halliday (1985) and Thompson & Couper-Kuhlen (2005: 485), working in the traditions of systemic-functional linguistics and Interactional Linguistics, respectively, have demonstrated that the clause is a locus of interaction. Halliday (1979) proposed an account of the intrinsic functional organisation of the clause in terms of four general semantic functions, or 'metafunctions', each with its distinctive mode of formal expression. Halliday's term 'metafunction' designates four kinds of intrinsic functional organisation that are interwoven as distinct layers in the organisation of utterances. Each such layer makes a contribution to the meaning and organisation of the utterance as a whole. Table 1 shows the four semantic metafunctions and provides information on the kind of functional

organisation they contribute to in the clause, their typical grammatical systems, and their mode of formal expression in the clause.

Metafunction	Type of Meaning	Typical Grammatical Systems	Mode of Expression
Textual	Clause anchored to situated locus of interaction	Theme-Rheme	Wave-like; periodic
Interpersonal	Clause as exchange of information and/or goods-&-services	Mood, modality, polarity	Field-like; prosodic-scopal
Experiential	Clause as representation	Transitivity; lexis	Particulate; constituency
Logical	Dependency relations within, and below the clause	Parataxis and hypotaxis	Recursive construction and recursive meta-modification; operator-operand relations; 'thing' deixis in the nominal group and 'event' deixis in the clause

Table 1: Halliday's four semantic metafunctions in the clause

In the analysis below, I show how in different yet complementary and overlapping ways the four metafunctions proposed by Halliday contribute to the clause as a locus of intrinsic functional interactive constraints and enablements on utterances. The clause is a locus of functional constraints and enablements that operates on unfolding phases or pulses of the flow of embodied first-order languaging and interactively constitutes them as dialogically organised loci of interaction.

From the point of view of microgenetic theory, an utterance develops over a series of phasal transitions that reflect the hierarchic organisation of neuroanatomical structure (Brown, 2015; Tucker, 2002; Tucker et al, 2008). Rather than their activation by central brain processes, utterances (and other mental acts) have their origins in the deepest layers of pre-cortical brain organisation and are progressively developed upwards over various phases with their phasal transitions of brain activity. Successor phases are increasingly specified with respect to their antecedent phases until the endpoint of the process in the form of the phonetic or graphic actualization of an utterance. A spoken utterance arises with the elicitation of a series of rhythmic levels that begin with oscillators for the breath group and rhythmic timing and transition across the various phases of its microgenetic development to the fine-grained phonetic detail of the final utterance. Both microgenetic theory and Wundt's (1970/1900) account of the apperception of an initial relatively undifferentiated and more diffuse whole indicate that all mental acts — utterances included — have their intra-psychoic origins in more global, less differentiated antecedent configurations.

Wundt's (1970/1900) concept of the *Gesamtvorstellung* captures this aspect of the derivation of an utterance. The *Gesamtvorstellung* is a vague, antecedent apprehension of a situation prior to its further specification as an articulated situation-utterance matrix. According to Wundt (1970/1900), an utterance begins with the apperception of a global or holistic representation (the *Gesamtvorstellung*). The *Gesamtvorstellung* is the simultaneous dimension of sentence structure. As Wundt's theory of the sentence shows, apperception involves both the simultaneous and sequential aspects of sentence structure. Wundt explains the relation of the outer form of the utterance to the inner psychological factors which determine it as follows:

The outer form is only the result of the process. It is, moreover, an end product which shows by its nature that the psychological factors determining a grammatical utterance are themselves distinct from the utterance. The sentence as an *inner* psychological construction must have a simultaneous quality in addition to the sequential one. Without this quality it could not be a coherent totality (Wundt, 1970/1900: 22).

The « outer form » of the sentence, Wundt observes, is only the end product of psychological processes that determine the sentence structure. Like Brown's microgenetic theory, the sentence is progressively elaborated through a series of phases before the final end product emerges as the actualised public utterance.

This overall « cognitive configuration » (Wundt, 1970/1900: 22) is « formed into successive segments by the process of apperception » (Wundt, 1970/1900: 22). The differentiation of a particular aspect of the overall topology is, Wundt says, an act of judgment when the agent differentiates a particular feature rather than some other as the focus of attention. This feature is the *psychological subject* (Halliday, 2004/1985: 56; Wundt, 1970/1900: 24; cf. Halliday's concept of 'theme' in the clause). The psychological subject picks out and differentiates that particular aspect of the experiential topology which the speaker apperceives as the starting point of the process of utterance construction or of utterance comprehension. Having selected and differentiated a particular feature of the overall topology, the agent comments on it or otherwise modifies it in some way. The initial differentiation is a holistic structure (Wundt's *Gesamtvorstellung*) that is simultaneous. The *Gesamtvorstellung* is an antecedent configuration⁴ that precedes and anticipates the final linguistic structure.⁵

The *Gesamtvorstellung* is a more global type of pre-linguistic organisation that is progressively differentiated until the terminal point of its actualization as the specific lexical exponents of a particular linguistic structure. Instead of saying that the clause is an assemblage of parts into a larger whole, the clause is a meta-grammatical formulation of a more global principle of linguistic-semantic organisation that can be lexically specified to a more delicate degree. Prior more holistic pre-linguistic wholes are not the causes of utterances. Rather, they are potentials of becoming (Brown, 2015: 104). The initial whole is therefore a virtual potential that can be unfolded along diverse trajectories of actualization. As the relatively undifferentiated antecedent whole differentiates into its component parts along the various transitional phases of its microgenetic trajectory, the parts that are specified at each phase of the trajectory

⁴ Brown (2005: 227) points out that evidence for the existence of antecedent configurations is shown by the way they "deposit prematurely as the symptoms of brain damage."

⁵ Wundt's *Gesamtvorstellung* has also inspired McNeill's idea of the Growth Point, seen as the initial impetus for the emergence of a speech-gesture complex that is unfolded out of the simultaneity of the initial Growth Point. McNeill argues that there is a dialectical relations between the initial Growth Point and the unfolding speech-gesture complex because the nonlinear GP continues to shape the emerging speech-gesture complex (see McNeill and Duncan, 2000).

constitute further potentials of becoming. This helps to explain the relationship between 'grammar' and 'lexis' in the clause.

Let us consider the utterance, *Chubby was eating on his stick*, which was the opening utterance in a recount by my then twelve-year-old daughter a few moments after the incident in question. Chubby is a pet hamster. The stick is the hamster's chewing stick or food stick (Figure 2). Just prior to coming to my room to recount the event, my daughter had observed Chubby chewing on his food stick before accidentally rolling over and then regaining control. The event was sufficiently noteworthy at the time to prompt my daughter to recount what she had observed to me. For present purposes, I confine the discussion to her opening utterance.

My daughter's utterance is a locus of interaction. The more general grammatical schema are potentials for further becoming that derive to the specific lexical categories are the microgenetic endpoint of the more general grammatical categories. Thus, a global transitivity structure such as Actor-Process: Action-Goal is a more general potential in which further possibilities of specification are immanent, e.g., *Chubby* (Actor) *was eating* (Process: Action) + *on his stick* (Circumstance: Location). Of course, one can, analytically speaking, decompose the clause into its parts. My point, in line with the microgenetic account, is that the parts are derived from a prior whole and not the other way round. Having established the principle of whole-to-part derivation, rather than part-to-whole assembly, we can then see that the more global level analytically represented as the linguistic structure of the clause is in fact a resource for construing situations or aspects of situations that have been progressively differentiated and articulated as different facets of a prior, more global pre-utterance/situation matrix. On this view, the lexical items that instantiate specific categories of participants, processes, and circumstances in the clause are embedded in the prior apprehension of a global situation as the more natural way of experiencing them.

Table 2 presents the multilayered functional organisation of the utterance, *Chubby was eating on his stick*, showing the clause as a locus of intrinsic functional constraints and enablements.

Function	Clause as Locus of Interaction Potential					
	Chubby	was	eating	on	his	stick
Theme; periodic; wave-like	Theme: situational focus of primary salience	Rheme: further specification of Theme, culminating in the clause-final salient item stick				
Mood: scopal-prosodic	Subject	Finite: Time	Predicator	Adjunct		
	Mood		Residue			
Stance: declarative proposition located in dialogical space of arguability						
Transitivity: particulate whole-to-part organisation (constituency)	Actor		Process: Action	Circumstantial Operator: Location		
Situation						
Dependency: recursive modification; operator-argument/operand relations		Finite Time operator grounds utterance in time		Circumstantial operator provides further specification of situation		

Table 2: The utterance *Chubby was eating on his stick*, showing multi-layered intrinsic functional organisation of clause-level constraints and enablements

The four semiotic constraints outlined above show that the intrinsic functional organisation of utterances integrates the different phases in the ontogenetic development of the child's languaging and the microgenetic traversal of an utterance-in-becoming across the various phases of its generation. Utterances integrate and re-organise to their own intrinsic functional principles of organisation the following phases in the microgenetic derivation of the utterance:

1. The initial apprehension of an antecedent situation (cf. Wundt's *Gesamtvorstellung*) in the form of a holistic, relatively undifferentiated Self-Subject-Affect dynamic. My daughter apprehends a global, relatively undifferentiated situational matrix that prompts or provides the motive for a linguistically formulated I-stance: Chubby ^ affect dynamic ^ me —> I-stance. It is noteworthy that she came to be in a state of great excitement immediately after the event in question. Clearly, what she saw had affected her to the point where she wanted to tell me about it. Affect is important both in relation to her initial perception and in relation to her utterance though it does not follow that the same affect necessarily prompted both. Over many years, researchers in microgenetic theory (Brown, 1979, 1988; Rosenthal, 2004; Sander, 1930; Visetti, 2004; Werner, 1957/1940;), in psychoanalytical theory (Ehrenzweig, 1965; Schilder, 1951a, 1951b; Varendonck, 1921) and in neurobiology (Brown, 2015; Damasio, 1999, 2010; Hart, 2008/2006;

Trevarthen, 1979, 2009; Tucker, 2002) have shown that affects are the stimulators of perception, memory, utterances, and other mental acts)⁶.

2. The elicitation of a series of rhythmic periodicities synchronizes the self's attention to some particular feature of the situation that serves as an initial focus of attention and thus as the starting point for the process of utterance construction. The perception of temporal pattern enables the self to attune to and synchronize with pulses of rhythmically organised space-time. Peaks in this rhythmic, wave-like movement foreground the informational salience of items whereas troughs recede into the background. Catherine's utterance both arouses attention and focuses it on a specific aspect of the experiential topology that is thematised or made salient by the initial peak of rhythmic activity. Given that it is the initial utterance in her recount, this initial focus moves the two of us to converge on a particular location in the topology that her utterance evokes. The rhythmic peak that establishes the initial focus is a « basin of attraction » that serves to change brain dynamics from one basin to another in order to redirect attention and awareness. I was working on my computer when Catherine came to my room to recount what had happened to Chubby and the food stick. Her utterance thus serves to move us both into that "basin" and to sustain and further modulate that focus over the duration of her recount. The *Gesamtvorstellung* is thus apperceptively segmented into two basic components: (1) the psychological subject as the initial anchor point in the situation for the development of an utterance about it; and (2) the further transformation of the psychological subject in the form of an incipient stance on or interactive orientation towards it. These two components correspond to two peaks of prominence of an oscillatory rhythmic wave that prepares for an anticipates the co-synchronization of addressor and addressee to these two rhythmically salient aspects of the situation. In the clause, this antecedent configuration is specified as the Theme — Rheme structure of the clause. This rhythmic structure thus serves to co-synchronize to an emerging figure (the utterance-in-becoming) that is progressively set off against a situational ground with which it is co-articulated in increasingly more differentiated ways. This begins a process of *entextualization* that differentiates and yet co-articulates utterance and situation. The periodic synchronization of the clause as a wave-like flow consisting of two peaks of prominence that anchors the utterance to a selected feature of the local context (Theme) that is indicated as the current locus of concern and it so doing this periodic flow synchronizes participants to salient features of the flow and its further development in the utterance (Rheme). In this way, the utterance thematizes a stable anchor point in the

⁶ The relationship between the self and its objects is not then one of 'representations' that mediate between the inner world of the self, defined as a fixed entity or substance, and the outer world of the self's objects. The self has both endophasic (internal) and exophasic (external) aspects that develop in parallel with the self's objects. Microgenetic theory shows that the subject pole of the subject-object relation generates the object pole. The two poles are co-articulated aspects of a single derivational process. Wordings and other mental objects can also enact dream imagery, mental verbal and visual imagery, recollections, etc. that are part of self and thus remain 'inner' or covert aspects of endophasia (Bergounioux, 2001, 2010; Bottineau, 2012). On the other hand, world-side objects detach from a self in the final phases of microgenetic construction as they are adaptively pruned by incoming stimulus information and sculpted as perception of a world-side object (Deacon, 1989). In this sense, world-side objects as they appear in perception are adaptive models of things that the self attends to in the flow of its mental life — including its languaging (see Thibault, 2017). The two poles—self and its objects — are co-articulated aspects of a microgenetic derivational process. They are generated by both endophasic and exophasic aspects of microgenetic construction.

situation so that participants can co-synchronize the synchronization of utterance and situation to that aspect of the situation that the utterances requires them to attend to.

3. The synchronization of the agent to these kinetic rhythms induces a « change in arousal » (Deacon, 2005: 275; see above) that the initial apprehension of the situation sets up at a very early stage in the neurological derivation of an utterance. This gives rise to a pre-mood interactive field of relations and affects together with the motivation and arousal to orient to a particular interactive stance within that pre-mood frame. In the structure of the clause, this initial intensive modalised field of affect is organised in terms of the scopal-prosodic character of the clause as a locus of interpersonal interaction (McGregor, 1997: 64-70). The speaker takes up a specific interactive stance in relation to the entity — Chubby — in which the speaker invests the modal success of the incipient utterance. For example, the mood operator in the clause holds the entire clause and modifies its grammatical shape to indicate its interactive status and thus to indicate an interactive stance on it. The selection of declarative mood thus selects *Chubby* as the Subject in which the speaker modally invests by taking up an interactive stance in relation to the Subject.

4. The initial segmentation of the incipient situation described in (2) above is further differentiated by the analysis of the situation as a configuration of functionally diverse roles and the relations between them. The functional diversity of semantic roles (participants, process) that is manifested in the transitivity structure of the clause constitutes a unity and derives from a more diffuse, more global precursor unity -- a more holistic apprehension of an incipient situation -- that constitutes the commonality of origin of the diverse parts or roles that are actualised in the derivational process as particular lexical selections. In the final product, the particulate or constituency relations in the clause analyse the different components of a situation into a configuration of functional role relations. These roles are not, however, disparate parts that are assembled to form a whole, but parts that derive from a prior whole that is specified into its parts. Persons activate and tap into that prior unity and the experiences that it evokes. In the example, this loose configuration of functional roles can be specified as CHUBBY + ACTION: EAT + STICK.

5. The loose configuration of functional roles in (4) are related to each other and to the emerging situation in more specific ways by the dependency relations in and beyond the clause that specify the relationships between the functional roles in the clause, their relations to the situation, and to other utterances. For present purposes, I confine the discussion to dependency relations within the utterance at the level of the clause. Dependency relations consist of operators and the arguments that operators operate on and recursively modify in some way. In the verbal group, the Finite operator TIME: PAST operates on the process EAT to ground Chubby's action in the past. Moreover, the prepositional phrase *on his stick* is a circumstantial operator that operates on its argument *Chubby was eating*. This argument describes a situation. The Circumstance is a constraint that circumscribes the action described by locating it in relation to the food stick. The entire utterance is itself an operator that operates on a prior situation that my daughter witnessed and which she then evokes for me in her recount about it.

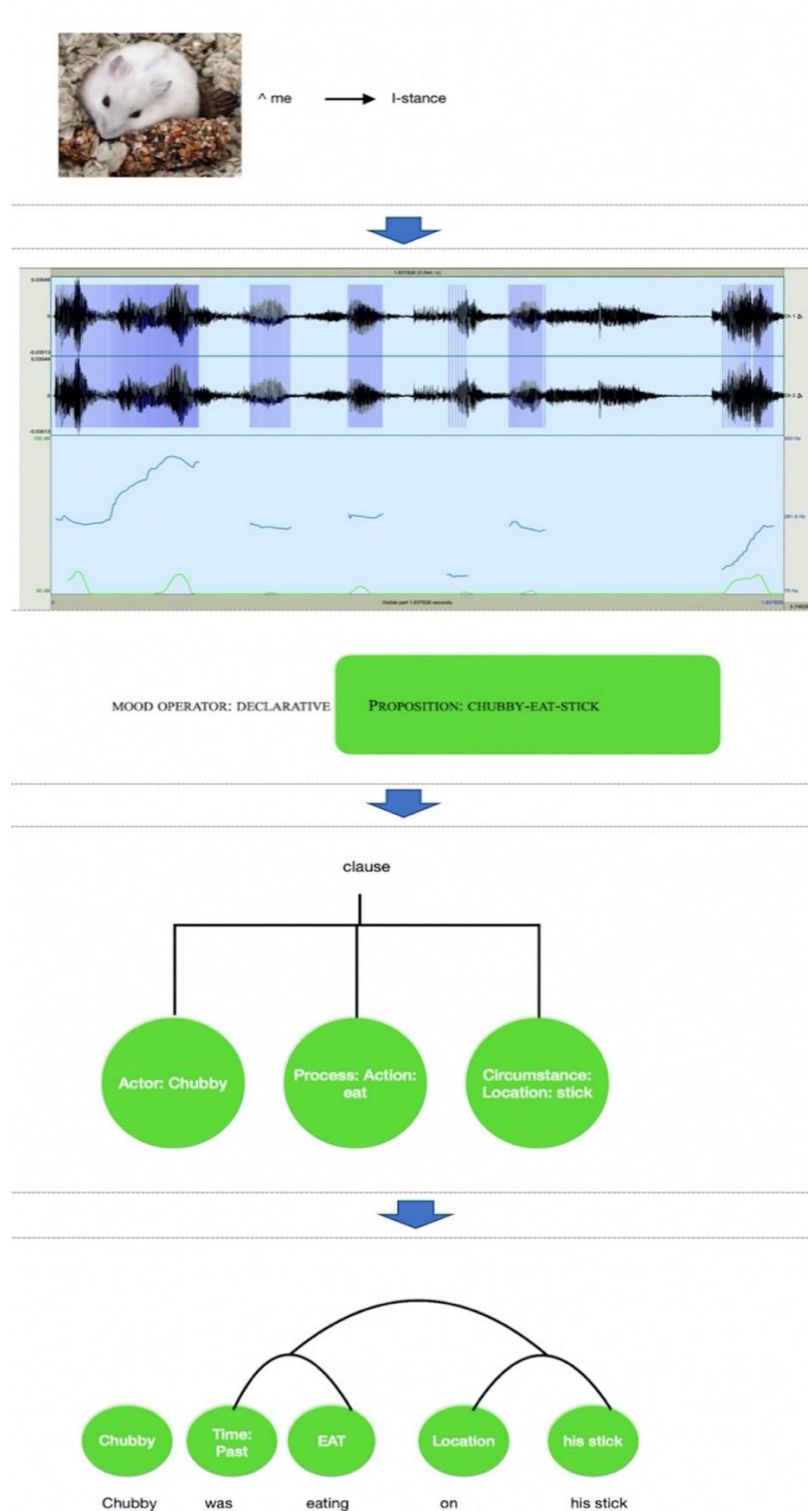


Figure 2: Five phases in the microgenetic transition from the initial relatively undifferentiated focus on the situation through the various phases in the increased differentiation-articulation of the utterance-situation matrix

Reading from top to bottom, Figure 2 re-constructs the progression from the initial apperception of the incipient antecedent configuration — c.f. Wundt's *Gesamtvorstellung* — through the five phases in the microgenetic transition from the initial relatively undifferentiated

focus on the situation through the various phases in the increased differentiation-articulation of the utterance-situation matrix, as follows:

1. The initial incipient situational configuration: Chubby affects Catherine and prompts an I-stance^[L]_{SEP}] in relation to her 'me'. In this initial phase, there is awareness of emotion and value and incipient awareness of experiential content.
2. The apperception of and synchronization to rhythmic oscillators that thematize Chubby as^[L]_{SEP}] the situationally anchored starting point of the utterance as the focus of attention^[L]_{SEP}]. The *Praat* analysis shows that the rhythmic periodicity establishes two peaks of prominence focusing on CHUBBY and STICK, respectively. CHUBBY is thus established as the situational anchor for the development of an utterance about him. In this phase, the rhythmic pattern organises multiple and competing primary percepts into an overall Gestalt that is anchored in time and place.
3. The speaker's scoping of a declarative stance on the utterance-in-becoming in which the proto-declarative mood operator holds the incipient utterance in its scope and shapes it to indicate the speaker's interactive stance on it. In this phase, an orientation to a still incipient overall meaning begins to be shaped for interactive ends.
4. The initial segmentation of the utterance into a configuration of not-yet-lexicalised functional role relations. The overall meaning-shape referred to in 3. begins to be shaped by the environment that the utterance-in-becoming strives to co-articulate with, in the process providing a higher degree of specification of the situation model prior to lexical specification as the trajectory of the incipient utterance leans more into its situation.
5. The specifying of the dependency relations showing the recursive modification of arguments by their operators. Operator-argument dependency relations impose a partial ordering on the utterance-in-becoming that enables the final order of the lexical selections to be specified.

As Table 2 shows, all of the above factors leave their trace in the final utterance as diverse modes of overlapping and multi-layered intrinsic functional organisation. The transition across phases 1 to 5 shows the filling in of more of the detail as the utterance-in-becoming transitions across the diverse phases of its microgenetic development, with earlier phases being integrated to and re-organised by later ones. Thus, the initial configuration in 1. is integrated to an oscillatory rhythmic pattern that establishes a situational anchor point in 2. This rhythmic oscillator is in turn integrated to the prosodic-scopal shaping of the pre-mood orientation of the utterance-in-becoming in 3. In 4, the utterance-in-becoming is chunked into the diverse functional roles that will become its transitivity structure. In 5, the recursive operation of dependency relations specifies the relations of inter-dependency between different components of the increasingly differentiated-articulated utterance-in-becoming thus allowing content lexis and functional lexis to be filled in.

Instead of saying that the clause is an assemblage of parts into a larger whole, the clause is a meta-grammatical formulation of a more global principle of linguistic-semantic organisation that can be lexically specified to a more delicate degree. Each phase from 1. to 5. above in the corporeal schematization of the utterance that I have re-constructed above shows how different functional parameters, starting with more holistic rhythmic oscillators and the prosodic-scopal shaping of an interactive orientation to a situation and ending with more fine-grained differentiations such as participant roles and the relations between them, are phases in a continuous space of microgenetic construction of the utterance-in-becoming. Each phase is a progressive honing and parametrization of the shape of the final utterance. Each phase is a potential from which the successor phases emerge that influences the further development of the microgenetic construction process. As Table 2 shows, the different phasal contributions to

the final utterance are evident in the layered blending of different and overlapping modes of functional organisation that contribute to the organisation of the final utterance.

Of course, one can, analytically speaking, decompose the clause into its parts. My point, in line with the microgenetic account, is that the parts are derived from the whole, and not the other way round. The microgenetic construction of an utterance is a highly textured configurational pattern of brain activity that draws on affect, feeling, imagination, memory, and value in order to model an utterance that yields hypotheses and anticipations that are tested in the dialogical space of arguability in which interactive stances can be tested, corrected, refined, and changed (Halliday, 2004/1985: 110; Thibault, 2005a, b, 2012). For example, Declarative and interrogative mood assert or question propositions, in contrast to imperatives, which are proposals for action. Propositions can be argued about from different points of view. They can be affirmed, denied, agreed with, doubted, contradicted, supported, and so on, by other persons in their dialogical uptake of them. Persons are not all knowing. They are deictically anchored to a body and to the viewpoints that their embodiment enables. In their languaging, persons continually probe and test their environments, seeking responses from others. Moreover, their own languaging activity also continually changes their environment by assimilating to others' languaging and by enacting coherent actions that affect the environment, including other persons.

6. Utterances as Movement, Growth, and Becoming: Moving Along Together

An utterance is a dynamic corporeal schematization (section 1) that enables or seeks the co-articulation of the self with the particular aspect of the world that is indicated and activated in the local experiential topology by the utterance. The corporeal schematization of an utterance is an operation on the interaction flow at the same time that the utterance is the movement in time of an action trajectory. Rather than static structures, utterances are organisations of process that are constrained and scaffolded by intrinsic functional constraints that provide indications to participants as to how to move in time with the flow of the utterance, to follow its indications, and to attend to them. Linguists have often reduced utterances to static abstract structure, dissected their component parts, and proposed often arcane rules of combination to explain how the supposed parts of utterances were put together to form the whole. Consequently, the life was removed from living languaging.

Deleuze and Guattari (2004/1980) proposed the idea of « lines of flight » to show that we extend into the world trajectories of movement and becoming that get intertwined with and entangled with other's lines of flight. Ingold (2016) uses the idea of the knot to illustrate how the diverse lifelines that people extend into the world becomes meshed with those of others to form sometimes very dense and thick interpenetrations of peoples' lifelines. Ingold (2016) has used the term *correspondence* in relation to the ways we move along with each other and with other beings and objects in the world we live in. Adelbert Ames Jr. (1955) also writes about 'correspondence' in ways that are similar to Ingold's notion when formulating the relationship between stimulus pattern, environmental situation, and the personal contribution of the perceiver in explaining the perceiver's awareness of the environment. In their languaging, people lay down pathways along which they move, taking others with them (Thibault, 2021 a, b). Figure 3 and related discussion show how Catherine's utterance is a flow of verbally modulated whole-body sense-making activity that I have analysed into three micro-phases.

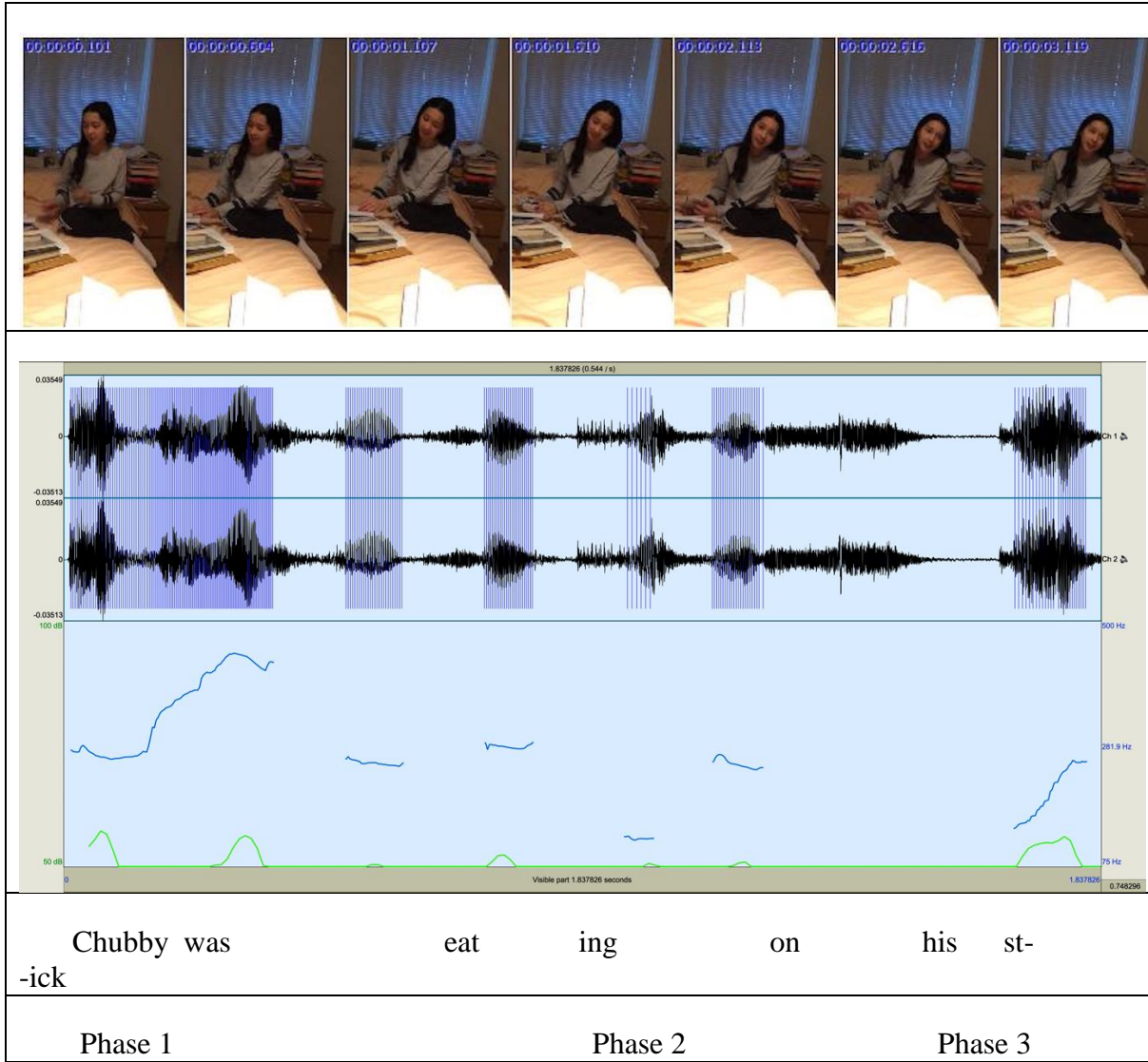


Figure 3: The three micro-phases of the utterance *Chubby was eating on his stick*

The three micro-phases of the utterance shown in Figure 3 are as follows:

Phase 1 (0.364030 s): The pitch (blue line) rises markedly from a low of 276.5 Hz to a high of 429.9 Hz, encompassing the segment *Chubby was*. There is a marked surge of intensity (green line). Catherine's eye gaze and body posture are adjusted to focus on one of the books lying on the bed. She reaches for one of the books and grasps it.

Phase 2 (0.774069 s): The pitch movement ranges from an initial 262.8 Hz and falls to 124.3 Hz and is held fairly steadily around this value for the duration of this phase, which extends over the segment *eating on*. Catherine begins to lift the book in her hand. Her eye gaze and body posture continue to be directed to the book she has in her hand until *his*, when she adjusts her body posture and eye gaze to attend to me.

Phase 3 (0.667851): The pitch moves from 259.6 Hz to 246.7 Hz on *his* and moves from 141.2 Hz to 251.3 Hz on the final syllable of *stick*. There is a surge of intensity on this syllable. Noteworthy is the lengthening of the onset consonant cluster, /ST/, which

extends for 0.300265 s. Catherine continues to lift the book with her two hands while looking at me.

The three phases of the actualized utterance unfold from a prior virtual simultaneity that is present in the pre-linguistic infrastructure. The serial order of utterances derives from prior, implicit relatively undifferentiated meaningful wholes that enable utterances to be apprehended as having a simultaneous and a global organisation that exists prior to their enactment as serially ordered utterances that unfold in time. Utterances transition over a single mental epoch from the unconscious simultaneity and spatiality of their beginning phases to the seriality and temporal order of the conscious end phases of their microgenetic derivation. The earlier phases are not the causal inputs to the later ones, seen as the outputs (effects) of the earlier ones; rather, all phases are embedded in the final endpoint of the derivation and actualize together on completion of the end-phase (Brown, 2010: 14-15). The endpoint — the completed utterance — is a cycle of phases from earlier to later that constitute one epoch.

The utterance analysed in Figure 3 is the time-extended laying down of a pathway of exploration and discovery — a *line of flight* (Guattari, 2016/2011) — that Catherine and I move along together as Catherine begins the process of developing her recount of Chubby and the food stick. Her utterance is the further development in the serial time of the utterance of this latent potential. In following this movement, Catherine and I, from our respective viewpoints, attend to different facets of the development of the movement trajectory that the utterance unfolds. In the subsequent development of her recount, the book she takes hold of becomes Chubby's food stick as she evokes what she had witnessed only moments earlier in another room before coming to me to tell me about it. The utterance is embedded in a larger matrix of bodily mimetic activities. Indeed, it is more accurate to say that her utterance, these mimetic activities, and the book she takes hold of are all co-synchronized aspects of a single line of movement and becoming — a line of flight — that we explore together.

Utterances are structures of action involving differentiated role relations such as Actor and Goal or Agent and Patient in the transitivity structure of the clause. In these models, action and passion are the same thing. As Fabbri (1998: 41) points out, the action performed by the agent affects the patient such that the passion is the point of view of the person who is affected by and transformed by an action. Werner and Kaplan's account of the 'corporeal schematization' that takes place in the co-articulation of self and its objects further shows that whereas linguists have tended to consider the utterance to be a 'linguistic' object of study in its own right, the structure of action and passion also includes the person who performs the action and those who are affected by it (Thibault, 2002). In this sense, Catherine's utterance is necessarily embedded in a larger action structure, as set out below:

SELF ₁ : Catherine: Agent: Addressor: I	Action Performed: her utterance: <i>Chubby was eating on his stick</i>	SELF ₂ : me: Affected: Addressee: you
MODALISING AGENT	MODALISING LINGUISTIC ACTION	MODALISED AGENT

Table 3: The utterance *Chubby was eating on his stick* embedded in larger structure of action

Table 3 shows that the utterance is an action that is performed by a self to affect another self in ways that are anchored to a situation. One self seeks to move the other self. The structure of the action is not the utterance per se, but also includes the two selves who enact it and are affected by it, respectively. Seen in this light, the intrinsic functional organisation of the

utterance serves to establish the orientational framework that stabilizes a dialogically coordinated interactional focus. *In breve*, the utterance (1) thematizes an interactional focus; (2) the Subject of the clause instantiates and grounds the utterance in terms of Person deixis in which the speaker invests a modalised interactive stance. This stance is attached to first person speaker addressor or second person addressee, who are interactive participants in the dialogically coordinated array of I/you, or to a non-participating third person participant to which addressor and addressee can co-orient; (3) the differentiation of participant roles and their relations specifies a situation image or referent situation that can be continuously updated; and (4) thing deixis in the nominal group and event deixis in the clause recursively operate on and specify to varying degrees of definiteness/indefiniteness and actuality/non-actuality the referent situation and its participant roles with reference to the viewpoints of the addressor and addressee.

The wording *Chubby was eating on his stick* constitutes the higher-order constraints on her whole-body-sense-making activity, not just the vocal part. Catherine modulates her body along the task-specific functionally organised lines specified by the lexicogrammatical order parameters in the clause to produce a co-articulated bodily action that links her both to aspects of the immediate situation in which we are co-present at the same time that she evokes in the present what she had witnessed Chubby do just moments earlier. Indirect evidence for this prior whole lies in the fact that, at the onset of her utterance, Catherine reaches out to grasp the book-cum-stick, which is not mentioned until the final part of the utterance. Whereas the verbal aspect thematises Chubby in the onset phase, her hand action shows the anticipation and development of another aspect of the overall idea, which is made prominent in the final stage of the utterance. In other words, her vocalisation, shifts in eye gaze and body posture, and hand action attend to different loci of concern and unfold them as the time-extended development of different aspects of the prior simultaneity that was present in the prior *Gesamtvorstellung* that was initially formed in response to the scene she witnessed.

The utterance is then a further development and elaboration of that initial complex of affect, feeling, and imagery. However, utterances, while originating in these antecedent configurations, are their further differentiation and articulation. Werner and Kaplan propose four different yet inter-related generic components of the situation in which symbolic activity occurs. The four components of the orthogenetic principle are four parameters along which increasing distancing and differentiation occur (Werner and Kaplan, 1984/1963: 44-51). The four components are as follows: (1) between person and object; (2) between person and sign vehicle; (3) between symbolic vehicle and referential object; and (4) between addressor and addressee.

According to Werner and Kaplan, the developmental changes brought about by the increasing distance in symbol-situations in the life of the child take the form of "increasing differentiation of the components of symbol-situations and of increasing integrative systematization (autonomization) of symbolic forms." (1984/1963: 40), in accordance with what Werner and Kaplan term the 'orthogenetic principle.' Werner and Kaplan (1984/1963: chap. 3) present the notion of the "orthogenetic principle" in order to explain both (1) the increasing articulation and differentiation of symbolic forms; and (2) their increasing integrative systematization (see Werner & Kaplan, 1984/1963: 40).

The antecedent configuration mentioned above is a covert organismic schema. Werner and Kaplan (1984/1963: 48) refer to this as the « inner form » of the sign vehicle as distinct from the « outer form » that is manifested in concrete utterances. In the current example, Catherine's mimetic bodily activities are the concrete external manifestation of aspects of the inner form of her utterance. The vocal utterance, on the other hand, manifests increased distance and hence

increased differentiation and articulation though it too is not entirely separated from the covert organismic schema from which it derives.

With some adjustments, the four components of Werner and Kaplan's account of distancing can be assimilated to the account of the multilayered intrinsic functional organisation of utterances outlined above. It is this organisation which enables utterances to co-articulate selves to selected aspects of their worlds, including other selves.

First, the thematisation of Chubby as the locus of an incipient utterance is a rhythmic periodicity that shapes consciousness of the situation relative to the embodied point of view of the self by anchoring that point of view to a rhythmic pulse of salience in relation to which the self and its point of view is coordinated (Thibault, 2004: 57) (Figure 3). The increasing distance between persons and objects means that self and its objects are no longer fused as holistic affective — sensory-motor patterns (Werner and Kaplan, 1984/1963: 44) as in infancy. At later development stages, a functional shift occurs that enables objects to be perceived as existing in the world beyond the self. When this occurs, objects are perceived for their functional capacities — their affordances — for action at the same time that the object and the self's relation to it can now be assimilated to internal sensory-kinetic schema and models for operating on, manipulating and thinking about the objects in the world beyond the self.

Secondly, the increasing distance of Catherine from the utterance and related mimetic activity means that these are partially lifted from the flow of activity and reified as sign vehicles that stand out against and are partially distinguished from the flow. They therefore assume greater salience as does a figure in relation to its ground. The utterance and related mimetic activity therefore draw attention to themselves as being distinct from yet related to their surrounds in ways that are significant. Utterance and mimetic activity are said to be *entextualised* in this sense (Urban, 1996). They assume an artefactual status that makes them stand out from their surrounds. An artefact is an organisation of material processes that arises in and through human activity at the same time that it is embedded in and is used in human activity. Artefacts are material products of human agency that exist independently of social practices but can be used and interpreted in them. Artefacts have structures of information and potential ways of operating them that are built into their material organisation and which can be used and interpreted in human activities and practices. Utterances are also actions. They are first-order bodily actions produced by the vocal tract and related bodily movements that are constrained and enabled by second-order linguistic pattern. In this sense, a spoken utterance is a gesture-sound-wording complex. Second-order linguistic pattern is detectable in utterances as patterns of words and wordings (Thibault, 2011a).

Thirdly, the increasing distance between utterance and referent situation is manifested in the fact that these activities occur after the observed episode is concluded. The utterance uses a conventional grammatical schema. However, this schema retains aspects of its concrete origins. The book is integrated to the mimetic activity and becomes Chubby's food stick, which Chubby grasps with his front paws while chewing on it. The activity described by the schema is a concrete activity that iconically resembles the observed activity. The transitivity structure of the clause analyses the perceived event in terms of a number of separate components -- Chubby, the action of eating, the food stick -- that bear an iconic resemblance to the different components of the perceived event. The proper noun *Chubby* indicates specific properties of the well-fed hamster. The noun *stick* specifies a particular kind of object that has properties and affordance potentials that make it suitable for grasping and manipulating by means of the hand or paw.

Fourthly, the increasing differentiation of addressor and addressee is a selection pressure that enables the self to participate in an increasingly diverse heteroglossic field consisting of other

selves with their diverse often conflicting stances. In encountering these differences and the semiotic-modal friction that they generate, the self is motivated to develop increasingly autonomous stances in a relational field of other selves and their stances. This provides the incentive for the child to transition from his or her proto-language to the languaging practices of the community of languaging selves in which the infant participates. To do so, the child increasingly draws on and dialogically appropriates the community resources in order to participate in the dialogically coordinated interactive stance-taking that is entailed in languaging activity.

Fifthly, the emergence of languaging from the antecedent forms of the infant proto-language involves a trade-off between the subjective microgenetic origins of utterances in intra-psychic process and the requirement to orient to social and cultural norms and values that languaging entails. Languaging is a communal resource that has been fashioned over many generations by many different persons. It is a kind of semiotic-cognitive commons (Tallis, 2020) that all can contribute to and that all must draw on, appropriate and transform in their dialogically coordinated languaging with others. The communal-historical dimension of languaging means that it exists in an impersonal domain on the population scale that allows for historical depth through the recursive construction and modification of one's own and others' utterances. Languaging becomes increasingly detached from and independent of individual selves in ways that make it increasingly able to be recursively acted on and modified by more languaging by other selves. Thus, one word (*red*) can recursively operate on and modify another word, *wine*, to yield the nominal group *red wine*. The adjectival operator operates on its nominal argument in two ways. First, it gives rise to a new construction resulting from the combination of the two terms. Secondly, the recursive application of the operator on its argument modifies the meaning of the latter term.

I call these two possibilities *recursive construction* and *meta-recursive modification*, respectively. Recursive construction and meta-recursive modification give rise to new operator-argument relations and restrictions on the probability of co-occurrence of both words and things in the world and words and word classes. Languaging recursively operates on the world and on itself. These recursive operations have historical depth that yield consensual domains when collective usage patterns with their co-occurrence restrictions enable the dialogical coordination of persons, their viewpoints, understandings, perceptions, and so on. Utterances are forms of action that recursively operate on the particular aspect of the experiential topology that they point to and indicate in particular situations as the currently active aspect. Consensus is achieved by these recursive operations, not by the encoding, transmission, and decoding of thoughts or ideas between persons (Kravchenko, 2003; Maturana, 1970).

As I pointed out above, these recursive operations and the dependency relations that they give rise to both within utterances and between utterances and the contexts that are apperceived to be in operation are local in character and are therefore presupposed to be locally accessible by the participants in the interaction. Given the very rapid time scales of the order of several hundred milliseconds of brain activity in the case of the microgenetic derivation of an utterance, the historical depth of this recursivity is critically important. In this way, a lot of interaction history is embedded in the organism thereby enabling the feedback loops across a relatively small number of neuroanatomical and bodily levels to embody the relevant higher-level semiotic constraints on languaging activity. If this were not the case, it is difficult to see how the tiny time scales involved in microgenesis could allow for significant and persisting inputs from higher-scaler levels of social semiotic organisation.

The five parameters outlined above specify five ways in which the intrinsic functional organisation of utterances enables them to co-articulate diverse functional components, including persons, their utterances and other actions, artefacts and tools of many kinds, aspects of situations, and so on, into larger-scale assemblages. Bodies have the capacity to form functional assemblages with other bodies. In other words, bodies have the capacity to form functional structures with other bodies — human and nonhuman, animate and inanimate — while maintaining the heterogeneity of the component parts of the assemblage. Utterances have, in varying ways, the capacity to co-articulate and to affect the bodies that comprise a socio-cognitive-affective assemblage. I derive the term “assemblage” from the work of Deleuze (2004/1968) and Deleuze and Guattari (2004/1980). Deleuze and Guattari define affect as a body’s capacity to act and to be acted upon. Utterances are operations on situations that can catalyse particular social effects in a given assemblage when the right conditions prevail. These effects are activated when thresholds, i.e., critical points or singularities, are crossed. In the example, Catherine's utterance indicates Chubby as the specific locus of concern in the process of activating and modulating a flow of activity, attention, and awareness that enables us to move along together in the process of exploration and discovery that her utterance activates.

An assemblage functions both to enable and to constrain its interacting components. An assemblage can be parametrized, following Deleuze (2004/1968) and De Landa (2010: 12-13), along two main dimensions. The first parameter is the degree of territorialisation and/or deterritorialization, which can refer to the spatial boundaries of a whole. It can also refer to the extent to which the assemblage homogenises its component parts. In the episode analysed above, the utterance serves to co-orient the two persons, their spatial positioning relative to each other in the room, and the book-cum-stick in the formation of a larger-scale assemblage in which the components of the assemblage are homogenised to the extent necessary to 'territorialise' the interaction and thus to mark it off from its surroundings.

The second parameter is the degree of codification and decodification. Codification refers to the role played by languaging in fixing the identity of a social whole, e.g., a community, nation state, a dialogue between persons, a shared inter-world, and so on (De Landa, 2010: 13). The two participants orient to linguistic and other norms that work to fix (codify) the identity of the whole. In Catherine's home, a number of languages somewhat fluidly work to codify the social identities of the different relationships and associated practices and affective commitments. Catherine, Chubby, and I share an interworld. Our languaging plays an important role in the fixing of the identity of that interworld.

Selves extend into and are entangled with many aspects of the « interworlds » (Linell, 2009: 160) that connect them to other selves and to the meshwork of the extended human ecology over diverse places and times. By the same token, these interworlds and the selves who live in them constitute what Ingold (2013: 11) calls a « zone of interpenetration ». Selves incorporate their interworlds just as the interworlds that form the common ground of selves are entangled with the neurohormonal and bodily dynamics of selves (Stuart & Thibault, 2015). Linell’s idea of the interworld shows that the actions, feelings, perceptions, thoughts, and utterances of selves are relational phenomena that are always in some way entangled with aspects of the life trajectories of selves and their entanglements with other selves and with the affordances, artefacts, institutions, and technologies of the extended human ecology.

In their zones of interpenetration, selves engage in dialogically coordinated languaging. The dialogical nature of this activity means that there is a symbiosis of two or more interacting systems. When two or more selves interact in this way, their internal and external dynamics interpenetrate and are entangled. Their respective actions are no longer causally independent.

We cannot pose why questions about the one without also posing them about the other. The dialogical coordination of selves constitutes a new system with its own behaviours, its own processes, its own identity, and its own environment. The dialogical coordinations that recursive languaging enables between persons take the form of constraints and enablements that leave their trace in the formal organisation of languaging.

A dialogically coordinated system of two or more interacting selves constrains the reciprocal behaviours of all parties. In contrast to the prevailing view that decomposing a dialogical system into its subsystems and analytical parts to yield a de-contextualized collection of analytical units that reductionism requires, it is necessary to view the higher-order, context-dependent dialogical system as the source of the system's capacity to change its *identity* in contrast to environmental factors that merely change behaviour. Selves and their identities are dependent on higher-order context-dependent system relations that are irreducible to their decomposition into analytical parts and subprocesses. The co-articulation of self-object relations gives rise to the dialogical coordination of self-systems and their environment.

The transition from infant proto-language to the communal language (or languages) is an adaptive transition that is invested in the social survival of the infant qua developing self. The social semiotic environment of the infant does not simply affect or change behaviour. Instead, it is an environment of a kind that can change system *identity*. This involves the kinds of interactions between scalar levels that I discussed in section 3. The emergence of the languaging self is a change of system identity of this kind. The self emerges in dyads of caring in which the actions of the two participants, e.g., mother and infant, enhance each other's survival and fitness. The dyad is a symbiosis of the infant and parent systems. As I showed in section 3, the reorganisation of the higher scalar social semiotic environment requires the child to adapt the initial three-person interaction system described by Halliday to the new requirement to take up more diverse modal stances on changing environmental conditions.

This requirement forces changes that are more than a simple expansion of a behavioural repertoire. Instead, the changes make the system's identity — the child's identity — dependent on the changing social semiotic environment and the changing demands that it makes on the child. The child adapts by transitioning to the communal language and thus the ability to participate in an expanding diversity of interactive-stance taking as a criterion for membership in the community. The emergence of the languaging self therefore involves interactions between behaviours, languaging included, and identity through the mediating effects of the environments that exert selection constraints on the self. Thus, the ability to participate in the heteroglossia of contrasting intentions, viewpoints, values, and motives selects for the languaging self. The self is drawn into the attractor landscape of languaging as a final causation that is inherent in adaptation.

Moreover, the emergence of selfhood just is adaptive. The ability to participate cooperatively in a society of selves, in contrast to the ideologically prevalent but destructive doctrine of the self-interested neoliberal self, means that the self is a new kind of being who is adapted to take advantage of the dialogical cooperation that a society of selves enables and requires. A society of selves has capacities that individuals don't have. These capacities create the conditions that favour the long-term survival of all members rather than of the individual per se. This entails changes on all levels of the scalar hierarchy that I discussed in section 4. With respect to the proto-linguistic infant, the languaging self is a new kind of social being, with new identities, new body-brain patterns, and new agentive capacities which could never emerge except through one's active and responsive dialogical participation in a society of selves.

7. Languageing is Self-organising Constraint-satisfying Activity: Endogenous and Exogenous Factors

Catherine's utterance is more than just the vocal dimension. It is a whole-body movement of sense-making activity that we attend to and follow together along the various phases of its development. Catherine's utterance is a living line of movement and becoming. Catherine has just come to me from the room where Chubby is kept. I am in my study at work on my computer. She sits on the bed where a number of books have been placed. She faces me while she speaks. We attune to each other through mutual eye gaze, body posture, and other factors. I record the episode with my mobile phone. As the analysis in Figure 3 shows, the micro-temporal development of the utterance as a flow of movement features a rising pitch contour over the segment *Chubby was*. Catherine's eye gaze is directed at one of the books lying beside her on the bed. She reaches out to grasp one of them.

The lexicogrammatical patterns that we perceive as wordings in utterances are high-order global constraints that specify a pattern of parameters within which the body-brain dynamics of languageing agents are co-articulated. Lexicogrammatical order parameters constrain and bias action, awareness, feeling, and perception. They are attractors, i.e., implicit system properties that are manifested as patterns of wordings as the system dynamics are, over time, expressed through multiple iterations of languageing activity in a given population of languageing agents.

For example, the wording orthographically transcribed as *Chubby was eating on his stick* dialogically shapes and coordinates the bodies of the two participants —my daughter and myself — into a joint act of moving along in time with the utterance, attending to its unfolding affordance layouts, and interactively exploring these. In this way, participants modulate and shape their bodies in task-specific, functionally defined, dialogically coordinated, special purpose, linguistically constrained, and context-sensitive ways in order to co-articulate themselves by means of utterances to larger-scale socio-cognitive-affective assemblages (Thibault, 2011b: 57-59). Participants draw on high order cultural-semantic invariants — wordings — such as the configuration of *Chubby*, *eat*, and *stick* in the utterance. The co-articulation of my daughter to the particular aspect of the experiential topology that her utterance activates involves a process of corporeal schematization whereby vocal tract and other bodily gestures are re-shaped to form an utterance-trajectory.

The wording is like a script that specifies the parameters within which vocal tract and other bodily dynamics self-organise to yield vocal tract and other bodily action that is in accordance with the attractor landscape that the wording *Chubby was eating on his stick* makes manifest. Vocal tract and other bodily dynamics are assimilated to this clause-level pattern and are reshaped accordingly so as to yield a performance of a whole-body-sense-making trajectory that is co-articulated with the situation. Intrinsic functional constraints on languageing mean that it is adaptive and able to deal with a vast range of different situations. A small number of intrinsic functional constraints on languageing as action system provide simplex principles for dealing with complex social environments (Berthoz, 2012/2009). Languageing operates according to simplex principles so that we can manage our relations with the complex environments we live in (Thibault, 2019).

The addressee is not a passive receiver or decoder of a 'meaning' that is packaged in the utterance. These are simplistic and mechanistic ways of thinking that cannot do justice to the intrinsic complexity of living selves-in-languageing. Language can be modelled as if it were code-like, but such models are impoverished and reductive examples of how 'language' can be modelled as machines. The code model also applies to many machines. On the other hand, the

linguaging of living selves has its primordial origins in phylogenetic, ontogenetic, and microgenetic processes that no non-living system can realise. If we reach far enough back into any of these processes on their respective time scales, we will discover traces of anticipatory dynamics and final causations that point to the complexity of living systems as distinct from the simplicity of machines. These anticipatory dynamics and final causations always imply a 'why' and a 'because'.

Languaging is whole-body co-participatory sense-making (De Jaegher & Di Paolo, 2007). The addressee is an active co-participant together with the addressor. Languaging is a whole-body dynamics that is based on movement. It is grounded in the experience of our kinesic/haptic/kinaesthetic bodies in movement in the world. Languaging is a form of intentional body movement that is other-directed and which serves to move others to act, feel, perceive, think, and so on. Body-brain systems « shape themselves to accord with input they get by acting into the world » (Freeman 1995: 26). The neurobiologist Walter J. Freeman defines intentionality as « the process of a brain in action having the properties of unity, wholeness, and intent (the tension of taking in by stretching forth) ». The addressee is primed to be in a stance of expectation and attention (Freeman, 2000: 97). Utterances control and guide our and others' choices and ongoing exploration of the world. If one views utterances as the passive encodings of either thought or external sensation in accordance with empiricist doctrine, one misses how languaging is a form of intentional body movement that is other-directed and which serves to move others to act.

Living systems « shape themselves to accord with input they get by acting into the world » (Freeman 1995: 26). Addressor and addressee alike move on together along the pathways laid down by languaging. The reception of someone's utterance by the addressee is a form of co-participation whereby the addressee, in moving along with the movement of the addressor's utterance in a relationship of 'correspondence' (section 6), modifies and re-shapes his or her own brain and body dynamics in ways that co-articulate the addressor to the intent of the addressor's utterance and its unfolding affordance layout. On the part of the addressee, these movements may be less overt than those of the addressor, but they do nonetheless occur. As Freeman points out, the body changes its own form « to become similar to aspects of stimuli that are relevant to the intent that emerged from within the brain » (2000, 17). The addressee assimilates his or her body-brain dynamics to aspects of the utterance that are attended to and re-shapes their own dynamics accordingly. Whilst it is correct to say that the addressor is the primary producer of the utterance, it is no less correct to say that utterances and their meaning are co-produced.

The addressor's utterance, like any other sensory stimulus, evokes a spike of neural activity. This spike of neural activity serves to select a self-organising pattern of neural activity that is created by the sensory cortex to which the stimulus is directed (Freeman, 1995: 66). This pattern of activity is not, Freeman points out, a representational copy of the stimulus received from the outside, but a brief surge of neural activity that constitutes the meaning and value of the stimulus for the self. These varying surges of neural activity constitute memories of the stimulus information, not representations of it. Rather than invariance structures that would suggest a representation, the lack of invariance structures in this neural activity shows that neural activity varies in accordance with memory-driven meanings that are assigned to the stimulus. These meanings are not constant, but may vary from occasion to occasion. These patterns depend on past learning about the stimulus that has been embedded in the modified synapses in cortical networks. The patterns are therefore unique to each individual and are not specific to the stimuli that triggered their construction. The brain's response to the stimulus is the meaning that the stimulus has for the self in the context of the self's past experience. The

function of the brain is not to create representations of external reality. Instead, it is to create meaning.

Meaning in this sense is not linguistic meaning, but the meaning that is created by the processes of abstraction and generalization over the brain's responses to events in the world as these events are assigned their place as personal meaning in relation to the accumulated history of personal meaning we call experience. In other words, the many individual engagements with the objects and events in the world in the life of the self are transformed into a global meaning potential by the brain's own internal dynamics whenever the brain responds to external (and internal) events. This meaning potential is made and continually elaborated by the brain itself. The creation of meaning in this sense is what enables the self to lean into the world by a process of assimilation. Assimilation is the process of creating meaning that shapes body and brain so that the self can optimally engage with particular aspects of the world on particular occasions. When we actively concert our meanings with others in dialogically coordinated languaging, we make an effort, to varying degrees and with varying levels of motivation and commitment, to assimilate the meanings we interpret in others' utterances to our own viewpoints, as constructed and articulated by own bodily and neural dynamics (Freeman, 2000: 15).

Utterances have the capacity to partition or differentiate the experiential topology in local, context-sensitive ways as well as to coordinate the interactivity between agents. These high order cultural-semantic patterns (words and wordings) function as order parameters that organise the bodily dynamics of agents into structured, co-articulated relations between the different component processes of the emerging task — e.g., my daughter's utterance, her leaning towards the book lying on the bed, her grasping the book in her hand to make it into a 'stick'; and her showing it to me--that are assembled into a particular task as the movement develops along its time-extended trajectory. The bodies of the two participants, together with relevant aspects of the situation, are in this way shaped into a coherent action trajectory for the performance of ecological work. Coherent patterns of body-brain activity shape and modulate time-dependent coherent action trajectories that are shaped so as to co-articulate a functional fit between self and environment.

Fine-grained, micro-temporal voice and other bodily dynamics, on the other hand, are local constraints or « tuning parameters » (Saltzman & Kelso, 1983: 25). They are globally constrained by the lexicogrammatical order parameters to cohere in a vector field of action, for instance, as a declarative utterance that functions to activate and to indicate the CHUBBY-EAT-STICK aspect of the experiential topology. The energy and intensity of the vector field sustains coordination of all aspects, including phonetic minutiae of voice dynamics, so that even the most minute and fleeting aspects of voice dynamics have their say. Global lexicogrammatical constraints are thus tuned by local constraints specified by fine-grained body dynamics that are specific to the immediate Agent-Environment Interaction System. These body dynamics provides agents with feedback that enables them to adjust the utterance trajectory more effectively in order that the agent can stay adaptive, aware, and sensitive to changing circumstances. Importantly, micro-temporal aspects of bodily dynamics induce bodily feelings — Damasio's (1999) somatic markers — that can bias action and perception. In their languaging, people learn to track a complex matrix of environmental organisation that is spread across diverse time and place scales and is, moreover, continuously modulated by a fluctuating heterarchy of norms and values.

Utterances co-articulate relations of betweenness (Thibault, 2021b: chap. 2) that connect selves to selected aspects of their world. They are functional in the recursive self-maintenance and self-individuation of selves — not just of oneself, but of other selves too. An action is always attributed to a self rather than to some body part or subprocess of the self. The self is an

organised functional whole that persists in time. The actions that the self performs and that are sourceable at and attributable to the self are functional in the recursive self-maintenance of the self. It is the reflexivity of the self's actions that is crucial here. The self is an integrated locus of action-potentials. The self's actions extend from the self into its environment and back again as feedback loops — negative and positive — that regulate the flows of matter, energy, and information between the self and its environment. In recursively operating on its environment through context-sensitive selections from its action potentials, the recursive loops extending from self to environment that are established and maintained are functional in directing and organising the self qua functional whole as it explores and seeks functional fits with its environment.

The shelf life of associationistic accounts of the sign as an associative relation between a form and a meaning, or a signifier and a signified, is long expired. However, it continues to linger on in linguistic and social semiotic accounts of the sign in the English-speaking world. In Saussure's conception, signifiers were associated with their signifieds by mechanistic internal processes along the syntagmatic and associative axes of coordination by the language mechanism. However, it has no way of showing that utterances are forms of mental process that are directed to posing and solving problems, finding solutions, exploring possibilities, testing hypotheses, and so on. If signs are determined by the workings of an internal 'language mechanism' to create psychological associations of signifiers and signified, they could not be manifestations of adaptive, intelligent human activity (see also Wettersten, 2019). Rather than the dead end of the associationistic psychological views of the sign as a pairing or an association of a form with a meaning (e.g., Adami, 2019; Bezemer & Jewitt, 2009; Saussure, 1971/1915: 97-100), intrinsic functional constraints on languaging activity are the work of a complex non-optimized system (the self) that draws on the available resources in context-sensitive ways in order to yield social and cognitive outcomes. Languaging is a manifestation of intelligent human action that enables selves to seek and to co-articulate functional fits between self and selected aspects of their social and cultural environments. This further means that simplex internal processes that have their origins in the pre-linguistic infra-structure of the self are corporeally schematized and entrained to and shaped by global order parameters — e.g., lexicogrammatical pattern — that enable selves to interact in complex social worlds.

Rather than genetic or other hardwired constraints or rules that prefigure the final outcome, the microgenetic derivational trajectory of an utterance-in-becoming is constrained by functional semiotic constraints that are intrinsic to both languaging as a form of highly productive action and to the capacity of persons to participate in it (Bickhard, 1987; Deacon, 2003). These constraints are not built into the human brain, but are required by the very nature of symbolic action and therefore delimit the possibility space within which languages have evolved (Deacon, 2003), how they are learned in ontogenesis (Bickhard, 2004), and how particular utterances individuate in microgenesis. The precursors of these linguistic constraints, I argue, are grounded in the intersubjective character of action-perception and constitute the prelinguistic infrastructure that is the essential ground of all languaging activity.

Languaging is self-organising constraint-satisfying activity. It is a mode of action that is constrained by what one wants to do, seeks to achieve, anticipated consequences, and so on. Languaging is also oriented to and influenced by social and cultural norms of what is desirable, permitted, and so on. Internal constraints deriving from the pre-linguistic infra-structure and external constraints deriving from the semiotic, social, and cultural environments give rise to utterances. An utterance is the outcome of a selection-and-variation process along its entire microgenetic derivational trajectory that has its origins in a global or more holistic personal feeling-meaning. Languaging is time-extended activity not just in the sense that the utterance occurs over a determinate span of time, but also because its effects and consequences are

extended over times, places, and persons that languaging seeks to modulate and affect in some way. The incipient antecedent configuration that constitutes the origin of the utterance in the core self does not pre-specify all of the finer details of the final output.

According to the orthogenetic principle proposed by Werner & Kaplan (1984/1963), all mental processes undergo a progression from global and integrated brain and body structures and functions to more finely articulated and differentiated ones. In similar terms, Brown (2015: 18, 105) explains that actions are first organised in the proximal core of postural control. From its basis in the axial muscles, an action such as reaching for a cup of tea is progressively more differentiated into peripheral limb activity such as the movement of the arm towards the cup and the further differentiation of fine-grained distal (wrist and finger) muscles. According to microgenetic theory, this progression from global to axial and focal to distal is no less true of language (Tucker et al, 2008: 45-46). Languaging is a form of skilled action that has its origins in the embodied brain in global, more holistic structures of the core self. These holistic structures arise from limbic cognition at the onset of the mental process, as shown in Figure 4.

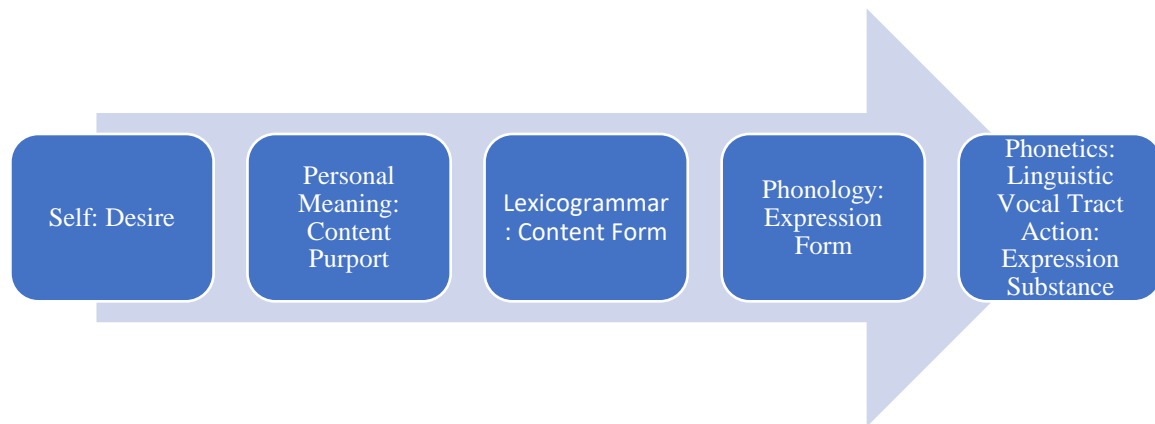


Figure 4: The vectorial nature of utterances as structures of action originating in the affective dynamics of the core self, showing the progressive articulation-differentiation of personal meaning as a linguistically structured vocal tract action, i.e., as a gesture-sound-wording complex, that has its deep origins in the core self

More holistic, less differentiated structure unfolds as microgenetic process on a milliseconds time scale of brain and body process towards more differentiated focal structures that are articulated as vocal tract (and other) gestural activity. These initial, primordial holistic structures are not totally undifferentiated. The term ‘holistic’ refers to an initial delimitation— itself a differentiation — that is made within a field of potentialities and which lays the ground for the emergence of a more differentiated structure (Sonesson, 2013: 536-537). The parts of a structure differentiate out of an initial, more holistic delimitation, in Sonesson’s sense), that nonetheless serves as an organising principle that relates its parts both to each other and to the whole. The utterance is in accordance with this initial holistic ‘delimitation’ at the same time that its further microgenetic development is a progressive specification of more and more detail.

When languaging is re-stratified as horizontal vectors of action rather than vertical hierarchies of formal levels, we see that the phasal transitions of an utterance-in-becoming constitute a constant process of re-articulation of a mobile and transformative process flow that has its origins in and is animated by affect and desire. Languaging is then, as Félix Guattari (2016/2011) theorised, an incessant production of desire. Paolo Fabbri (2020: 140) points out that Hjelmslev (1954) viewed his stratified conception of the linguistic sign as an « abstract machine » consisting of the intersection of two forms: expression form and content form. Rather than a vertical stacking of levels, the microgenetic derivation of an utterance evidences

the constant re-articulation of content as form and form as content that gives rise not to a static structure, but to « una linguistica dei flussi e dei processi » [a linguistics of flows and processes] based on, as Fabbri observes, an immanent trans-semiotics able to be manifested in all perceivable substances (2020: 141).

Guattari (2016/2011: 143) is right: The abstract machine of language cannot be explained by the developmental stages the child is said to traverse. Nor can it be explained by the phasal transitions that occur during the microgenetic derivation of an utterance. These are, rather, different aspects of the articulation of self to the social semiotic order and thus the stratification of the self (Thibault, 2021a: chap. 2). The processes of stratification that have fixed and stabilized — territorialised — the identity of a particular self are abstract machines of desire in families, schools, play groups, social media, etc. that latch themselves onto what Guattari (2016/2011: 144) calls the child's « intensities of desire », subjects them, and stratifies them to its logic. The discussion of Halliday's account of the transition from infant proto-language to 'language' shows the ways in which language crystallizes « heteroclite components » (Guattari, 2016/2011: 145) such as his relations with the three key adults in his meaning group, their presences and absences, the child's desires, the parents' desires, and so on.

Microgenesis shows how languaging, far from being reducible to a two-dimensional structural distinction between the associative (paradigmatic) and syntagmatic axes of coordination, crystallizes multiple lines of flight such as archaic affects, bodily habits, desires, fantasy, feeling, imagery, neurohormonal flows, oneiric elements, values, and so on (see also Bondi, 2017). Catherine's recounting to me of Chubby's encounter with the food stick reveals other fixings and stabilizations, including the territorialisation of an interworld that includes me, Catherine, and Chubby. Her desires and fantasies with respect to Chubby. Her acting out of these fantasies through bodily mimesis partly under verbal guidance. Her narrativisation of her experience to me. The separation of Chubby-time from the other periodisations of her daily life. The abstract machine of languaging brings together component processes from different scalar levels of social semiotic organisation:

L+1: The connecting of what Guattari (2016/2011: 146) calls the « dominant social stratifications » to the abstract machine;

L: the crystallisation of and co-articulation of individual desire to the abstract machine of languaging;

L-1: the self's desire.

The abstract machine of languaging co-articulates the self and its desires to dominant social semiotic stratifications and its repressive powers and disciplinary regimes that take over the child and de-stratify and then re-stratify him or her in accordance with dominant social norms. The orthodox take up of Saussure (1971/1915; 1993/1907, 1910-11) commits the associationistic error identified by Bergson of « reducing the self to an aggregate of conscious states: sensations, feelings, and ideas » (Bergson, 1950/1889: 165), which are seen as « no more than is expressed in their name » (Bergson, 1950/1889: 165). Saussure assumes that the underlying internal conditions of utterance construction can be explained in terms of the external products that are derived from them. The latter are projected back into the underlying unconscious processes. In this way, Saussure only retains their impersonal aspects and fails to see how it is the interpenetration of all of these psychic states within a definite person that enables them to assume the "particular colouring" that is a mark of the whole personality and character of the self. Bergson explains:

[...] there is no need to associate a number of conscious states in order to rebuild the person, for the whole personality is in a single one of them, provided that we know how to choose it. And the outward manifestation of this inner state will be just what is called a free act, since the self alone will have been the author of it, and since it will express the whole of the self (Bergson, 1950/1889: 165-166).

The interpenetration of different underlying processes rather than their aggregation gives utterances their « particular colouring ». They are imbued with qualities of the self who utters them. Linguists have viewed utterances as 'combinations' of elements on analogy with the metalinguistic models provided by writing. From the point of view of their microgenetic origins in the interpenetration of many layers of intra-psychic process, their « particular colouring » is more in the character of a blend of interpenetrating processes rather than a combination of distinct elements. Often very subtle changes in the colouring of the final product — the utterance — register changes in the internal conditions of the self as the self, processes and adjusts to changing internal and external conditions. Changes in the self's internal conditions prepare for and set up how the self will respond in its languaging to changes in its environmental conditions. A continuous virtual space of blended intra-psychic processes establishes the initial parameters that can potentially affect the next phase of the microgenetic construction process. In so influencing it, the given parameter is selected while others are de-selected or pruned. In carrying the selected parameter to the next phase of the derivational trajectory, the selected parameter constrains the further development of the trajectory of the utterance-in-becoming.

In the final utterance, the particular affective and other colouring is present in the distinctive blend of metafunctional constraints that give final shape to the utterance. Feeling-meaning blends and their striving for articulation along vectors of action and orientation are the primitive driving force of the microgenetic construction process.

8. Conclusion: Languaging and the Riddle of the Living Chicken

In the simple world of mechanism, as distinct from the complexity of living systems, the standard scientific question is: what can we learn *about* the chicken? We try to learn about chickens by taking them apart, analysing their component parts, and trying to figure out how the parts combine to form the functioning whole. But an analysis of the parts cannot answer the question 'why did the chicken cross the road?' The chicken's legs -- essential for its crossing the road — cannot be meaningfully separated from the rest of the chicken. We don't ask: why did the chicken's legs cross the road? However, that is how the language sciences have often proceeded with respect to languaging. Languaging is separated from living persons and treated as an 'object of study' in its own right. However, my contention is that we cannot separate languaging from persons in the way that we can separate and then re-assemble the different parts of a machine. We need to pose a different question: what makes living languaging live? The more we build simplified models of ourselves and our social life on analogy with machines, the less able will we be able to develop the conceptual structures for understanding ourselves and our place in the world of the living.

The ontology of living systems is different from that of machines. We build machines, as Rosen points out, « sequentially, by accretion, one structure at a time, one function at a time » (2000: 291). We do have talking machines like Siri. However, Siri does not language. Siri is programmed to recognise and respond to a bunch of patterns on the basis of rote production rules. However, Siri's pattern recognition abilities are devoid of motive. Siri has syntax but no semantics. Siri does not live in a world. Siri does not live in time. Living systems are of a

different kind. Siri is a simple manifestation of some aspects of the complexity of living systems that can recognise patterns (Matusov, 2020). Siri does not and cannot participate in creative dialogic languaging. Siri has no feelings, no interests, no motivation, no point of view, and so on.

But what can we learn *from* the chicken? When I was in primary school, we often told the riddle, « Why did the chicken cross the road? » No one could ever come up with a definitive answer. The question is well posed. The answer is not so simple. The chicken is a complex living organism, not a simple machine. It doesn't need me to impose my answer on it. It has its own reasons, like all living systems. Any answer to the riddle imposes my answer or your answer on the chicken. The answers are self-referring: they point to our human perspectives and our human ways of understanding. They do not and cannot answer the question from the chicken's perspective. However, they do raise a fundamental point. Living systems of all kinds are not simply reactive. They are guided by an anticipatory dynamic that draws them into their future. They do things to augment functional capabilities and to exploit organismic and environmental resources to enable them to do so. They co-articulate themselves with their worlds in ways that generate these possibilities. However, these behaviours are not programmed. The road is a human technology that forces the chicken's behaviour. The chicken is guided by an implicit *why* dynamic that is deeply felt, and which can only be answered by its own striving for articulation of its felt *because*.

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