SIGN
EVOLUTION
ON MULTIPLE
TIME SCALES

BOOK OF
ABSTRACTS

NASS VIII:

Sign evolution on multiple time scales

The Eighth Conference of the Nordic Association for Semiotic Studies (NASS)
Center for Semiotics, Aarhus University, Denmark, May 29th – 31st, 2013

What are the basic mechanisms and conditions for the emergence of new signs and sign systems (such as codes, notational systems, verbal and sign languages, gesture, graphical symbols, pictorial expression, etc.)? To which extent should we search for these mechanisms at the level of biology, culture, cognition, phenomenological experience or interaction? And what are the relevant features of signs themselves making them emerge, survive and propagate in contexts of communication?
The conference brings together international scholars from a range of disciplines each addressing central questions relating to the evolution of signs on different time scales ranging from biological and cultural evolution to ontogeny and online social interaction.

Book of abstracts

Abstracts are ordered aphabetically by (first) author's first name in the respective sessions. Please find the conference program on the next pages. Click in the program to jump directly to an abstract, or click here to jump directly to:

Plenary speakers | General sessions (I & II) | Experimental semiotics |

Biosemiotics | Dynamical systems | Poster session

Wednesday May 29th 2013

8:30 – 9:00	Arrival and registration
9:00 – 9:15	Welcome and practical announcements (Auditorium 1482-105)
9:15 – 10:15	1st Plenary (Auditorium 1482-105): **Susan Goldin-Meadow (University of Chicago):** *From homesign to sign language: Creating language in the manual modality* Chair: Kristian Tylén
10:15 – 10:30	Coffee break

	General session 1 (aud. 1482-105) Chair: Piotr Konderak	General session 2 (aud. 1483-251) Chair: Salmiah Abdul Hamid	Theme session (aud. 1483-244): **Experimental Semiotics** Chair: Göran Sonesson
Parallel sessions	**General session 1** (aud. 1482-105) Chair: Piotr Konderak	**General session 2** (aud. 1483-251) Chair: Salmiah Abdul Hamid	**Theme session** (aud. 1483-244): **Experimental Semiotics** Chair: Göran Sonesson
10:30 – 11:00	**Luis Emilio Bruni:** *On the embeddedness of sign-function*	**Francesco Bellucci:** *The Growth of Symbols*	**Göran Sonesson & Sara Lenninger**: *The Mirror Image, the Video Clip, and the Real World. A Study in Experimental Semiotics.*
11:00 – 11:30	**Len Olsen:** *Pointing a Finger to the Theory of Notation: On the Evolution of Signs and the Search for Meaning*	**Igor Zatsman:** *Sign emergence and propagation during interactive processes of knowledge creation by experts*	**Peeter Tinits:** *Application of semiotic experiments in linguistic research*
11:30 – 12:00	**Piotr Konderak:** *On "mutual enlightment" of Cognitive Semiotics and cognitive modeling*	**Salmiah Abdul Hamid:** *Intersections between Geosemiotics and Human Mobility in the Study of Road Traffic Signs*	**Gregory Mills:** *Making and breaking procedural conventions: partner-specific effects*
12:00 – 12:30	**Justin William Bernard Sulik:** *Cognition at the Symbolic Threshold*		**Peer Christensen & Kristian Tylén:** *Representing event structure in gestural communication*
12:30 – 13:20	Lunch		

Wednesday May 29th 2013 (cont.)

13:20 – 13:30	Announcements (aud. 1482-105)		
13:30 – 14:30	2nd Plenary (aud. 1482-105): **Nicolas Fay (University of Western Australia):** *The evolution of sign systems: Transitions from icon to symbol* Chair: Riccardo Fusaroli		
14:30 – 14:45	Coffee Break		
Parallel sessions	**General session 1** (aud. 1482-105) Chair: Alin Olteanu	**General session 2** (aud. 1483-251) Chair: Vikash Kumar	**Theme session** (aud. 1483-244): **Experimental Semiotics** Chair: Göran Sonesson
14:45 – 15:15	**Vytautas Tuménas:** *Patterns of Geometric Diagonal Ornament: Historical Transformations of Signification from Baltic Perspective*	**Jui-Pi Chien:** *Can we play with nature? A semiotic inquiry into the hidden links between Hegel's and Alexander von Humboldt's aesthetics*	**Daniel Barratt & Anna Cabak Rédei:** *Does the Kuleshov effect really exist?*
15:15 – 15:45	**Esteban Fredin-Ortiz:** *Ernst Cassirer and Charles S. Peirce's import on the semiotic modeling of language evolution*	**Vikash Kumar:** *Revolutionary Roads: Violence versus Non-violence – A comparative study of The Battle of Algiers (1966) and Gandhi (1982)*	**Monica Tamariz, Gabriella Vigliocco, David Vinson & Julio Santiago:** *The emergence and spread of iconicity*
15:45 – 16:15	**Alin Olteanu:** *Learning as discovery of relations of signification: hunger for knowledge as a result of evolution*	**Werner Schäfke**: Challenges and Methods of Cognitive Historical Lexicology of Old Norse	**Kristian Tylén & Riccardo Fusaroli:** *Neurocognitive trails of collective meaning construction*
16:15 – 16:30	Coffee break		
16:30 – 17:30	Founding Assembly of the **International Association for Cognitive Semiotics** (Auditorium 1482-105)		
17:30 –	**Poster Session (see below) and reception** Nobel Salen, Building 1485, ground floor		

Thursday May 30th 2013

09:20 – 9:30	Announcements (Auditorium 1482-105)		
9:30 – 10:30	3rd Plenary (Auditorium 1482-105): **Fatima Cvrčková (Charles University, Prague):** *Do cells speak creole?* Chair: Svend Østergaard		
13:00 – 10:45	Coffee break		
Parallel sessions	**General session 1** (aud. 1482-105) Chair: Peter Bakker	**General session 2** (aud. 1483-251) Chair: María Restrepo	**Theme session** (aud. 1483-244): **Biosemiotics** Chair: Kalevi Kull
10:45 – 11:15	**Gisela Bruche-Shulz:** *About an inner process and outward signs*	**Lene Rachel Andersen:** *The evolution of the semantic network of a pair of fashionably holed jeans*	**Kalevi Kull:** *Evolution of signs as evolution of types of learning: Emonic signs between index and symbol*
11:15 – 11:45	*Joel Parthemore: Conceptual Development on Multiple Time Scalesognitive modeling*	**María Restrepo:** *The graphic design production: a sign in itself*	**Søren Brier:** *The expanded ontology of Peircean biosemiotics*
11:45 – 12:15	**Peter Bakker:** *New languages: cognitive aspects of emerging grammars*	**Marianela Campos:** *Evolution of Symbols in Contemporary Popular Music and Underground Cultures*	**Sebastian Gaub:** *Semiogenesis: The Epigenesis of Semiosis*
12:15 – 13:15	Lunch		
13:15 – 13:30	Announcements (Auditorium 1482-105)		
13:30 – 14:30	4th Plenary (Auditorium 1482-105): **Bruno Galantucci (Yeshiva University & Haskins Laboratories):** *Experimental Semiotics: an engine of discovery for understanding human communication* Chair: Peer Bundgaard		
14:40 – 14:45	Coffee Break		

Thursday May 30th 2013 *(cont.)*

Parallel sessions	General session 1 (aud. 1482-105) Chair: Mats Andrén	General session 2 (aud. 1483-251) Chair: Inesa Sahakyan	Theme session (aud. 1483-244): Biosemiotics Chair: Kalevi Kull
14:45 – 15:15	**Mats Andrén:** *A Comparative Approach to Conventionality in Gesture*	**Johanna Arffman:** *Development of the semiotic system in the history of Christianity*	**Mette Miriam Rakel Böll:** *Brain, Body, Behavior: Integrative Semiotics*
15:15 – 15:45	**Svend Østergaard:** *What are text genres? The double feedback loop and the parameter theory of genres – part I*	**Dinda L. Gorlée:** *Kenneth L. Pike and Science Fiction*	**Morten Tønnessen:** *The ontogeny of the embryonic, fetal and infant human Umwelt*
15:45 – 16:15	**Peer Bundgaard:** *What are text genres? The double feedback loop and the parameter theory of genres – part II*	**Inesa Sahakyan:** *The evolution of signs in The Voynich Manuscript*	**Riin Magnus:** *The development of sign usage in the cooperation of the blind person and guide dog team*
16:15 – 16:30	Coffee break		
16:30 – 17:30	General Assembly of the **Nordic Association for Semiotic Studies, NASS**		
18:00 –	**Conference Banquet** (Nobel Salen, building 1485, ground floor)		

Friday May 31st 2013

09:50 – 10:00	Announcements (Auditorium 1482-105)		
10:00 – 11:00	5th Plenary (Auditorium 1482-105): **Winfried Nöth (University of Kassel)**: *The growth of signs* Chair: Peer Bundgaard		
11:00 – 11:15	Coffee break		
Parallel sessions	**General session 1** (aud. 1482-105) Chair: Peter Musaeus	**General session 2** (aud. 1483-251) Chair: Barend van Heusden	**Theme session** (aud. 1483-244): **Dynamical Systems approaches to semiotics** Chair: Riccardo Fusaroli
11:15 – 11:45	**Marilyn Mitchell:** *A pragmatic perspective on the sign system of genealogical diagrams*	**Ekaterina Velmezova & Kalevi Kull:** *Signs and concepts of signs evolving: A view from the "Tartu-Moscow semiotic tradition"*	**Svend Østergaard:** *Three mechanisms in biological systems working on three time scales*
11:45 – 12:15	**Peter Musaeus, Søren Læssøe Mathiesen & Mads Ronald Dahl:***The semiosis of students' conceptual understanding of biochemistry*	**Aleksei Semenenko:** *The Semiosphere, Cognition and the Emergence of Sign Systems*	**Riccardo Fusaroli & Kristian Tylén:** *Words, Actions and Heart Beats: how five people become one Lego-model-constructing system*
12:15 – 12:45	**Waldmir Araujo-Neto & Rosangela Silva:** *Semiotic aspects on the sign evolution of chemical structural representation between the late nineteenth and early twentieth century*	**Barend van Heusden:***Semiotic cognition and lateralization*	**Sebastian Wallot:***Understanding as a constraint on behavior: The dynamics of reading reveal a slow process in text comprehension*
12:45 – 13:45	Lunch		

Friday May 31st 2013 *(cont.)*

13:45 – 14:00	Announcements (aud. 1482-105)
14:00 – 15:00	6th Plenary (Auditorium 1482-105): **Jordan Zlatev (Lund University):** *Three key factors in human cognitive-semiotic evolution: bodily mimesis, alloparenting and multimodality* Chair: Svend Østergaard
15:00 – 15:15	Concluding remarks and goodbye

Poster session

Katrin Heiman, Maria Alessandra Umilta & Vittorio Gallese	*How the motor-cortex distinguishes among letters, unknown symbols and scribbles. A high density EEG study*
Drude von der Fehr:	*Being, Consciousness and Virtuality*
Elisabet Malmström:	*A semio-cognitive reconstruction of the sign*
Gabi Lipede:	*The end of aesthetic evolution: toward a macroevolutionary model of adaptive and null intersexual selection mechanisms*
Gunnar Sandin:	*Art and the evolvement of culture. The altering capacity of institutional critique*
John McGraw:	*The Nawales Speak: The Semiotics of Maya "Co-Essences" and the Doctrine of Signatures*
Catarina Isabel Grácio Moura:	*From Sign to Design*
Niels Bandholm:	*Excavating the final sign in Royal Jelling – musing on semiotic epistemology*
John Z. Elias	*From Success to Correctness: Linguistic Coordination and the Institutionalization of Practice*

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ABSTRACTS
PLENARY SPEAKERS

growth -sign -icon systems multimodality cognitive-semiotic evolution homesign creole Experimental symbol communication Three factors key modality Transitions engine language bodily understanding mimesis human manual language: Creating cells alloparenting Semiotics discovery speak signs

Bruno Galantucci (Yeshiva University & Haskins Laboratories)
Experimental Semiotics: an engine of discovery for understanding human communication

In this talk I will introduce a new research approach for investigating human communication—Experimental Semiotics (ES)—and situate it within its broader conceptual context. Then I will present three studies which illustrate in different ways how ES can act as an engine of discovery for understanding human communication. The first study illustrates how ES prompts us to question basic assumptions about human communicative behavior. The second and the third concern the elaboration and the testing of basic hypotheses about the design principles of human language. In particular, the second study illustrates how ES can stimulate us to elaborate brand new hypotheses while the third illustrates how ES enables us to test previously untestable hypotheses.

Fatima Cvrčková (Charles University, Prague)
Do cells speak creole?

Molecular biology studies cellular signaling and regulatory pathways, often metaphorically described as "the language of life"; thus, it would be a linguistic discipline of a kind. In such a perspective, human language and the cellular regulatory "language" present two specific implementations of a more general phenomenon of information processing and meaning making in living beings.

We are used to consider living beings as products of evolutionary optimization, akin to design optimization of human-made devices. Thanks to our experience with the world of computers, we may now accept seemingly sub-optimal (e.g. redundant or "degenerate") solutions of certain tasks; however, much of the complexity of cellular regulatory pathways remains hard to explain. This will be illustrated on the example of the multiple parallel pathways controlling the structure and dynamics of the eukaryotic actin cytoskeletons, where the diversity of co-existing mechanisms clearly goes beyond a mere "just in case" back-up.

The linguistic metaphor provides a perspective where such "redundant" or "degenerate" pathways are viewed as periphrastic expressions in the cellular "language". In human languages, the term "periphrasis" is used for a grammatical device, where several words are used in one language for something expressed by a single word in another (a semantic phenomenon). However, periphrasis means also a kind of paraphrasis, a figure of speech where meaning is expressed by alternative, roundabout means (i.e. a semiotic phenomenon). Periphrastic constructions in both semantic and semiotic sense are abundant in pidgins and creoles – i.e. languages that originated through "hybridization" or "symbiosis" of multiple parental languages. Intriguingly, extant eukaryotic cells are well known to be the descendants of two or more ancestral lineages merged by endosymbiosis. Thus some general feature of information or meaning processing may manifest itself here on vastly different time scales, both inside our cells and in human languages.

Jordan Zlatev (Lund University)

Three key factors in human cognitive-semiotic evolution: bodily mimesis, alloparenting and multimodality

An adaptation for *bodily mimesis* implying improved volitional control of the body (Donald 1991) can explain why human beings are particularly skillful compared to non-human primates with respect to imitation, empathy and gestural intentional communication. Since these are arguably prerequisites for language, I have argued that no extra adaptations for the language evolution (except for increased vocal control) need to be assumed (Zlatev 2008a, 2008b).

However, there are at least two questions that remain to be answered: (a) what ecological and social conditions brought about the evolution of bodily mimesis? (b) what lead to the transition from a predominantly mimetic form of communication to a predominantly symbolic one (using the vocal channel)? Hrdy's (2009) proposal that our ancestors underwent a transmission in major reproductive strategy to *alloparenting* (cooperative breeding) addresses the first question. The answer to the second question will be twofold: First, I emphasize that language is not a purely symbolic ("arbitrary") semiotic code, but a heterosemiotic, *multimodal system*, where even the vocal component is to various degrees non-arbitrary. Nevertheless, there are unique properties of "symbolic reference" that are absent in iconic-indexical systems. Two recent theoretical proposals of the (gradual) transition of iconic/indexical forms of expression into relatively arbitrary ones will be briefly reviewed (Brown 2012; Collins 2013), and a synthesis suggested.

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Nicolas Fay (University of Western Australia)

The evolution of sign systems: Transitions from icon to symbol

Pierce argued that signs evolve and in particular that symbols grow out of previous icons. This paper explores the cultural evolution of sign systems in the context of experimental semiotic studies. These studies show that graphical and gestural signs may be both iconic and symbolic at the same time exhibiting different degrees of iconicity and symbolicity. We show that among pairs

of interlocutors signs evolve from more complex iconic forms to simpler symbolic forms, consistent with a principle of least communicative effort. We also show that communicative pressures associated with the transmission of signs to a larger population of users favour the evolution of equally simple but more information-efficient iconic signs that confer specific acquisition benefits (beyond those observed among signs systems developed among pairs of interlocutors). Alongside our discussion of the benefits of icons, we discuss the limitations of iconic signs, and sketch some ongoing work that bridges the evolution of holistic sign systems to compositionally complex linguistic systems.

Susan Goldin-Meadow (University of Chicago)
From homesign to sign language: Creating language in the manual modality

Imagine a child who has never seen or heard any language at all. Would such a child be able to invent a language on her own? Despite what one might guess, the answer to this question is "yes". I describe children who are congenitally deaf and cannot learn the spoken language that surrounds them. In addition, they have not yet been exposed to sign language, either by their hearing parents or their oral schools. Nevertheless, the children use their hands to communicate—they gesture—and those gestures, called homesigns, take on many of the forms and functions of language. In the first part of the talk, I describe some of the properties of language that we find in homesign. These linguistic properties do not need to be handed down from generation to generation, but can be reinvented by a child *de novo*—they are the resilient properties of language, properties that all children, deaf or hearing, come to language-learning ready to develop.

But homesigners are not likely to develop all of the properties found in natural languages. In the second part of the talk, I consider which properties homesigners can and cannot develop by comparing their linguistic systems to those developed by deaf individuals in Nicaragua. Thirty years ago large numbers of homesigners were brought together for the first time and Nicaraguan Sign Language (NSL) was born. NSL has continued to develop as new waves of children enter the community and learn to sign from older peers. The first generation, taken together with subsequent generations and current day homesigners, thus provides a living historical record of an emerging language.

In the final part of the talk, I take an experimental approach to exploring when gesture does and does not take on linguistic properties. I examine hearing individuals asked not to speak and instead communicate using only their hands. Although these silent gesturers can create some properties of language on the spot, they do not create all of the properties that homesigners develop over time.

Winfried Nöth (University of Kassel)
The growth of signs

Evolution means growth, and growth is a biological phenomenon. Only organisms grow. Lifeless things may change, but they do not grow. Signs and sign systems change, but do they grow? Is it a "mere metaphor" to say that "signs grow" (Peirce)? Nevertheless, growth is also attributed to systems of objects and to social systems. We speak of new generations of products, urban growth, the growth of an economy, etc. mere metaphors?

Based on Peirce's evolutionary semiotics, the paper proposes answers to the following questions:

1. Are signs, such as words and cultural artefacts, lifeless things, mere products or instruments of living organisms and species, or do they have a life of their own?

2. Provided that signs grow, do all signs grow (and possibly also decay) or only some of them?

3. Does growth presuppose semiotic agency, and if so, who are the agents in processes in which signs and sign systems grow?

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ABSTRACTS
GENERAL SESSIONS

Aleksei Semenenko (Stockholm University)

The Semiosphere, Cognition and the Emergence of Sign Systems

The concept of semiotic space or semiosphere is arguably the most multifarious concept coined by Yuri Lotman which encompasses almost all the key notions of his semiotic theory. The semiosphere is defined as a precondition of all semiotic systems and modeling processes, including understanding and thinking. One of the cornerstones of the semiosphere is the dialogic principle that lies at the basis of the mechanism of meaning-generation. Through the concept of semiosphere, Lotman reformulates the structure of communication, stating that the dialogic situation "precedes both real dialogue and even the existence of a language," which equates the semiosphere with the notion of pre-language semiotic capacity of humans, advocated, among others, by T. Sebeok.

Furthermore, Lotman describes all semiospheric levels—from human personality to the text to larger semiotic unities (e.g., culture)—as "semiospheres inserted into one another," thus reiterating his thesis that culture is isomorphic to the individual consciousness (intellect). Consequently, semiosphere becomes an extension of human mind, a universal mind, and an individual mind in turn becomes a microculture. From that point of view, the ability of *Homo sapiens* to create, operate and modify new signs, texts, and sign systems turns out to be the central feature of human consciousness. Lotman's holistic theory can thus be interpreted as a theory of cognition, and the semiosphere—both as an object of the analysis and as a metaconcept, a methodological tool (Torop).

In my paper I will make a preliminary attempt to describe an approach to studying the generative mechanisms of human consciousness, following and extending the original definition of the semiosphere by Lotman and its recent interpretations by other semioticians (Nöth, Petrilli & Ponzio, Hoffmeyer, Kull).

Alin Olteanu (University of Bath)

Learning as discovery of relations of signification: hunger for knowledge as a result of evolution

Recently semiotics is gaining more attention from philosophy of education, the term *edusemiotics* already being in use (Danesi in Semetsky, 2009). This investigation approaches learning in schooling institutions which are a particular cultural and historical frame for sign emergence and development. Learning is here understood in a Peircean way, as a *play of musement,* a wondrous induction into meaning phenomena. By the time when the root of the present school curricula has been developed, by the same time with the emergence of a semiotic consciousness (Deely, 2009), St Augustine stated that "All teaching is teaching of either things or signs, but things are learnt through signs" (*De Doctrina Christiana*). Learning is continuous throughout evolution as it is continuous throughout an organism's life, since there is "a certain fundamental similarity of semiosis throughout all life forms" (Kull, 2005, p. 26-27). Peirce considered semiosis to be explanatory for the emergence of life, as life in the physiological sense is due to life in the metaphysical sense (CP 6.322). Stjernfelt argues that natural selection had to adapt to certain phenomena of meaning (2011). Gough and Stables explain that interpretation is a matter of adaptation, evolution theory being congruous with philosophy of education (2012). Understanding evolution as a web of signs, and not as an arborescent progression, learning can be understood as interpretation. Thus, biosemiotics is becoming relevant for philosophy of education. Interpretation is a competence resulting from the action of signs in the living environment (Kull, 2005). Approaching education from this biosemiotic perspective allows, without trivializing evolution theory, the understanding of learning in terms of meaning phenomena and not in the typical terms of cognitive capabilities (psychology) or social status and power relations (sociology). Learning means becoming ourselves by discovering relations of signification to which we adapted to re-cognize (identify and use).

References

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Barend van Heusden (University of Groningen)
Semiotic cognition and lateralization

In this paper, I will present and defend the hypothesis that the semiotic is a distinctive form of cognition, which evolved out of earlier forms of non-semiotic cognition. I will argue that his development was made possible by the specific use of a lateralized brain. Lateralization, which is found in many animal species (and which in primates is related to handedness), allowed for a double processing, in terms of stable and changing patterns, of visual and acoustic information. I will review the abundant scientific literature on hemispheric lateralization in the light of this hypothesis.

Once the double processing of visual information was in place, two different experiential realms – that of *stable memories* (which we will identify as 'signs', 'schemata', 'scripts', or 'concepts') and that of *an always changing actuality* (experienced as 'reality', 'substance', 'object', 'the thing itself', etc.) – did appear, as well as a relation between them, which we have become used to envisage as *intentionality* or 'aboutness'.

What distinguishes *actuality* from *memory* is the lesser stability of the former. Although *actuality* is recognized in terms of remembered patterns as well, the processing of the patterns is determined by the incoming information – the patterns 'adjust' as much as possible to what is perceived. 'Recognition of the unique' is, paradoxically!, what is at stake. This is mainly the work of the right hemisphere. At the same time, the stable patterns stored in *memory* that don't had to be adjusted to a changing actuality could become more precise and outlined – or 'abstract' – in the course of time. This discrete processing might have become possible because of the very precise movements of the hand processed in the same - left - hemisphere.

The coordinating (inhibiting and communicating) process, made possible by the corpus callosum, requires a substantial enlargement of the equally present 'comparator', or 'cockpit'

(frontal lobes). Evidently, the most could be made of this development if the set of available memories were considerable. Both factors (a large set of memories and a strong comparator) required brain space. Which could be the reason why the human brain got so large between 2 and 1.5 million years ago, and why the costs of such a large brain were worth paying.

Thus human cognition became *intentional*, or *semiotic*, not through the introduction of a new 'semiotic' organ, let alone through the emergence of mysterious 'memes', but by a relatively simple (in systematic, not in evolutionary terms) reorganization of the primate information processing system.

Once this form of cognition was available to humans, the semiotic provided the ground structure for an evolutionary development that was no longer strictly Darwinian, but followed its own - semiotic - logic. In the increasingly abstract ways in which the ubiquitous difference is dealt with, we discover this logic of cultural evolution, which determines the course of long term cultural change.

References

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Dinda L. Gorlée (University of Bergen)
Kenneth L. Pike and Science Fiction
Kenneth L. Pike (1912-2000) was an American missionary, linguist, and anthropologist, working from linguistic, anthropological, and theological perspectives. Engaging in phonetics, he turned to phonemics and text linguistics from rhetoric, semantic, and semiotic viewpoints. Pike introduced the multidisciplinary theory of tagmemics as branch of cognitive sciences. Tagmemics was grounded on emic and etic segments, united in suprasegmental configurations of linguistic and non-linguistic signals of human behavior. Pike's revolutionary goal was to encompass the unification of all sciences into a general, anthroposemiotic domain, as the alternative proposed to structural linguistics.

In contrast with structuralist mythologies, Pike's fascination with the new technology of astronautics started with "A stereoscopic window of the world" (1957), speaking about communication with a man from Mars. Pike's "A training device for translation theory and practice" (1957) proposed a training device for generating Kabala-X as alternative to Esperanto, Lincos, or Klingon. In 1973, Pike's "Science fiction as a test of axioms concerning human behavior," published in an inaccessible journal *Parma Eldalamberon*, suggested a science-fiction story of human/alien interface. The auxiliary language was an invented, artificial language to make extraterrestrial contact of earthmen with unknowable aliens from outside space. As tool for linguists, translators, anthropologists, and missionaries, the engineering life-form consists of tagmemic "axioms" to prove a device for testing human behavior. The science-fiction story renders, in scientific jargon, a pancosmic discourse without "grammatical" relevance of particle, wave, and field, spoken by an alien actor.

Far from ordinary speech, the obstacles of robot-like talk make oversimplified scenarios with no actor, in which our own feelings, moods, and involvements are left out. Without the interlocking of persons, units, events, causes, results, real communication with a vocabulary of a few hundred words set up a translatable (or untranslatable) fantasy-fiction. The relative failure of the ghost story of Peirce's degeneracy does not reach the semiosic units of representamen, object, and interpretant. Will the reconstruction of the android's virtual reality return to the *lingua franca* of humanity's *ur*-speech, buried in the fragmentation of the Tower of Babel.

Ekaterina Velmezova & Kalevi Kull (University of Lausanne & University of Tartu)
Signs and concepts of signs evolving: A view from the "Tartu-Moscow semiotic tradition"

Even if the problem of sign evolution was not the central one in the works of scholars who worked within the framework of the "Tartu-Moscow semiotic school", both their earlier research and more recent papers contain a number of statements about the development of signs, in particular, in the process of *communication*. It allowed them, among other things, to discuss the very origin of language and the process of language acquisition by children as semiotic problems. Analyzing a series of interviews organized with Tartu-Moscow scholars (Ju.M. Lotman, B.A. Uspenskij, V.V. Ivanov, etc.) we shall try to find out if there existed a(n implicit) common view about the evolution of signs in (human) communication which was shared by the majority of the Tartu-Moscow semioticians. We shall particularly discuss how the understanding of signs themselves evolved with time in the works of the Tartu-Moscow scholars: they often made an explicit intellectual start from F. de Saussure and from Saussurean linguistics, from the Saussurean binary model of the sign in order to abandon it later, passing to ternary and even quaternary models of signs (sometimes without being aware of this conversion). This change is interesting in the context of the wider turn towards a dynamic understanding of the sign that has taken place in semiotics since the 1980s. Our paper will therefore have the following double target:

- to analyze the views of Tartu-Moscow semioticians concerning the evolution of signs;

- to examine the (implicit) evolution of the concept of the sign in their own works.

Esteban Fredin-Ortiz (Aarhus University)
Ernst Cassirer and Charles S. Peirce's import on the semiotic modeling of language evolution

Computer modeling has become an important tool in science. It is particularly useful when it is not so easy to see what are the specific predictions a theory makes. This is often the case when dealing with complex systems. Semiotic research focuses on subjects that are complex by nature: distributed among many heterogeneous agents and across multiple time-scales. Semiotics is now experiencing a much needed experimental turn. In this stage, an important question is how we can translate its rich theoretical tradition into an experimental agenda. In this paper computer modeling of complex systems will be explored in the light of Peirce's theory of diagrammatic thinking. Next, it will look at how a simple language evolution model already proposed in the literature implements Peirce's three categories and how can it be further refined in accordance with them. Finally we will explore models of sign evolution through the lens of Ernst Cassirer's thought. The paper ends with a broader discussion on how biology, cognition and culture mesh in the heterogeneous phenomenon of language.

Francesco Bellucci (University of Siena, Italy)
The Growth of Symbols

Charles S. Peirce's claim that "signs grow" is well known. This view was first developed in his early works on the logic of science, in which the historical and cultural development of signs was seen under a cognitive perspective.

Likenesses or *copies* (icons) have connotation but lack denotation; *conventional signs* (indexes) have denotation but lack connotation; *symbols* denote *by* connoting. But in having both connotation and denotation, symbols have *information* too. Information is superfluous connotation, i.e., the part of the connotation that does *not* serve to fix the denotation. "Every addition to the connotation of a term lessens its denotation up to a certain point, after that further additions increase the information instead." No symbol is entirely destitute of information: the moment it

acquires sufficient connotation to fix the denotation, it already has more than enough to do so, and so has superfluous connotation, or information. The law of information is thus the law of symbolization, or transformation of non-informative signs (icons and indexes) into informative ones (symbols). This is indeed the general law of inference: *hypothesis* turns an icon into a symbol, *induction* turns an index into a symbol, *deduction* turns a symbol into another symbol of the same object.

"Every increase of our knowledge is an increase in the information of a term": *Omne symbolum de simbolo.* The increase of our knowledge is always embodied in a corresponding increase in the information stored in our symbols. The word *electricity* means more now than in Franklin's times, and so do words like *force*, *law*, *marriage*, etc. Through his sophisticated semiotic apparatus, Peirce was able to capture the essential core of any sign development whatever: semantic change is grounded upon a precise cognitive dynamics, which is best expressed in the terms of a *logic considered as semiotics*.

Gisela Bruche-Schulz (Independent scholar)
About an inner process and outward signs
This paper addresses the 'inner' process of sign emergence as revealed by 'outward' activities (after Wittgenstein 1953). Generating a sign requires an affective state that translates into a motivation for 'profiling hermeneutic motifs and schemes' in co- and contexts (Visetti 2004). But do we have to rely solely on intuition and introspection for exploring the issue? In my paper, experiential data will be described that put a quality of the 'inner' process in full view. The data, collected in five elicitation events and presented to altogether 86 respondents, consist of *responses* to a parallel text translated into typologically different languages. The response items will be briefly exemplified, and the presentation then turns to the *quantitative distribution* of the responses.

Unbeknown to the respondents, a sensing of a 'subjective' phenomenal experience (a wanting-to-know) is revealed through a regular distributional rhythm of withholding or giving responses. Across all respondent groups responses are withheld at textual segments whose semantics (e.g., speech and thought introducers, negative assertions, questioning words) opens an 'expectation' slot for more information to come (Hoey 2001). Response numbers go up when the information is provided. This situation suggests the presence of a recurring textual figure:
a 'wanting-to-know' [W] → to be 'satisfied temporarily' [TS]: (W→TS→W→ …).

I conclude that this covert sensing of a *wanting* opens the view on a layer of phenomenal consciousness. If so, the overt responses prove to be, as it does so often, just the proverbial tip of the iceberg. They actuate reflective consciousness that makes use of regular public language at the representational level (Musacchio 2005, Zlatev 2008). In contrast, the covert experience reflects a 'dynamic / kinetic form-in-the-making' (Sheets-Johnstone 2012), grounded in an affective state, a multifaceted desire that takes on the form of a sequential 'wanting-to-know' in a narrative context.

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Igor Zatsman (Institute of Informatics Problems of the Russian Academy of Sciences)
Sign emergence and propagation during interactive processes of knowledge creation by experts
The paper presents a semiotic framework for the study of interactive knowledge creation events on time scale. It is assumed that a knowledge system is being evolved by a team of experts that creates new indicators and their meanings. We proceed from thenotion of a goal-oriented knowledge system. The team of experts creates this system to fill a knowledge gap in a subject area. The gap can be identified through observation of the subject area (R&D Programme evaluation by indicators).

We define a goal-oriented knowledge system as an expert-created system of concepts for filling the knowledge gap. Our study has been caused by a need to fill the knowledge gap in indicators' knowledge system for R&D Programme evaluation by indicators.

The main emphasis is placed on temporal computer-fixed relationships between emerging indicators' meanings and their volatile denotata (indicators' data together with computer programs for indicators' calculation). Experts using computer programs can interactively fix own emerging indicators' meanings and their relationships with volatile denotata. Emerging meanings are temporal and changeable concepts in contrast to conventional concepts that have time-stable signifiers.

The basic mechanisms for the emergence of new indicators' meanings and signs are goal-oriented experts' cognition and interaction. The basic conditions for their emergence are a computer dictionary, which is a tool of propagation of new meanings and signs, as well as information and communication technologies.

Experts can specify time-dependent states of new indicators in the computer dictionary. Each state of any indicator is described by its digital denotatum, a meaning, and a name as an indicator signifier, which are used by experts to form an emerging personal or collective sign and to describe this sign by a dictionary descriptor. The dictionary is accompanied by online interactive time scale that provides linkages between emerging signs and discrete points in time.

Inesa Sahakyan (University of Perpignan, France)
The evolution of signs in The Voynich Manuscript: an attempt to demonstrate the evolution of sign meaning through a diachronic analysis of major attempts of interpretation of the Voynich sign system.
'The present is the time interval necessary for an interaction to take place; past, future and time, exist only for the observer,' notes Maturana (*Autopoesis and Cognition* 1980: 18). The present article is an attempt to observe and demonstrate the evolution of sign meaning on multiple time scales. It is concerned with one of the world's most mysterious sign systems conceived by an unknown author in mysterious characters and illustrated with stunning and puzzling images – *The Voynich Manuscript*. Its composite sign system is comprised of two major forms of representation – symbolic signs, constituting the script, and pictorial representations. For all the compelling nature of the illustrations, it is the script that puzzles the observer most since it can neither be read nor understood. Though the book was first brought to the world's attention in the 20th century, specialists suggest that the manuscript dates from the 15th century. In the course of time, numerous hypotheses were put forward to account for it. Despite centuries of extended research and the variety of methods and research techniques employed, the Voynich sign system stubbornly defies

interpretation. The questions remain whether the Voynich script contains a code or a natural forgotten language, whether it contains a message or is deprived of any meaning whatsoever. To demonstrate how the meaning of the Voynich signs has evolved through various interpretations that were made of them in time, we suggest conducting a diachronic analysis of major attempts of interpretation of the Voynich signs on multiple time scales. We hope, our findings will advance the understanding of the evolution of signs on the one hand, and on the other – the meaning of the manuscript, and ultimately lead to the identification of novel strategies for the resolution of the Voynich mystery.

Joel Parthemore (Lund University)

Conceptual Development on Multiple Time Scales

In order to make proper sense of sign development, one requires a proper understanding of, on the one hand, communication development and, on the other, conceptual development, where sign use is a subset of communication and communication is dependent (logically and empirically) on a pre-existing conceptual framework, such that "conceptual framework" is understood as systematically and productively structured thought. This sets me in opposition to a large number of researchers who either equate concepts with language (Wilfred Sellars, Donald Davidson, John McDowell) or linguistic meaning (Jens Allwood) or who take it as a matter of empirical investigation that concepts require language (Jerry Fodor, Zoltan Torey). Within the framework of cognitive semiotics, this paper offers a comparative account of conceptual development on three timescales side by side: phylogenetic, cultural/historical, and ontogenetic. In this way, it highlights what they have in common – e.g., the kernel of truth, for conceptual development, in the frequently misapplied notion of "ontogeny recapitulating phylogeny" – and where they differ. It assesses the current state of empirical investigation on each timescale – in the respective fields of comparative cognition, "history of ideas", and child psychology – and the opportunities for empirical investigation in future. It describes the author's plans to take a mind-mapping software program, written for his doctoral thesis as a translation of a particular theory of concepts – based on Peter Gärdenfors' conceptual spaces theory – and apply it to empirical investigation of both concepts and theories of concepts, in general, and conceptual development (on the ontogenetic timescale) in particular. Finally, it ties this back to the question of sign development, showing where the points it raises are most vital to those discussions.

Johanna Arffman (University of Helsinki)

Development of the semiotic system in the history of Christianity

Christianity can be understood as a complicated semiotic system. A signification system of a similar level is present in human language. Language is a key to Christianity in two ways. First, the message of God comes to the human being through content, transmitted by the human language. Secondly, the message comes through the form of signification system. Thus, the reception of the message requires a certain level of abstract thinking from the receiver.

In other religions of antiquity, gods revealed themselves to the people in pictures and the earliest form of writing was pictographic writing. In contrast to this, the Judaeo-Christian tradition emerged at the same time as the western Semitic alphabetic form of writing. In Judaism, as well as in Christianity, God reveals himself in his Word.

How did Christianity's signification system emerge and develop? In Christianity emphasis is placed on communication. According to the Bible, God told people about himself. The Word existed already before the beginning of creation, for God created the world through his Word. God made man in his image. This is the first phase of "the signification system of Christianity": the image, *sign* (human being) and *concept* (God), which is hidden from people. A turning point in the understanding of God's message was when the Word "became flesh" in Jesus. God himself

appeared to the world as a man. The missing *reference* was visible to the people. Thus, the binomial *sign-concept*-figure became tripartite, like a linguistic system.

The attitude towards Jesus divided people: some "believed", others did not recognize him. The recognition of a symbol as a linguistic sign is always the key to a linguistic system. This is the case also in the "signification system of Christianity." The recognition of Jesus as Son of God or "belief," means *semiosis*, or transition from human language into the next system of signification, where Jesus is the *sign* and God is the *concept*. According to the Bible, this is caused by the Holy Spirit which can be compared to Peirce's *interpretant*. In this way, a new tripartite relation emerges: the Holy Trinity.

The last phase of the development of the meaning system of Christianity is the shedding of the Holy Spirit to the church. Sacraments too, work through the Holy Spirit and only through persons authorized by the church. The church can be compared to a linguistic community. Signs have a signification only within the semiotic system.

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Jui-Pi Chien (National Taiwan University)

Can we play with nature? A semiotic inquiry into the hidden links between Hegel's and Alexander von Humboldt's aesthetics

This study seeks to discover some hidden links between Hegel's *Introductory Lectures on Aesthetics / Philosophy of Mind* and Alexander von Humboldt's *Aspects of Nature / Cosmos* in the light of Saussurean sign functions. Such an exploration also aims to reconcile the presumed opposition between philosophic and evolutionary aesthetics in our times. It is suggested that the Saussurean idea of the vulnerable, changing, and non-adaptive qualities of syntagmatic combinations serves as a common ground to mediate between the ideas of the absolute and the sublime, developed by Hegel and Humboldt respectively. Their ideas such as allegorical thinking (as practiced in culture) and total impression (as experienced in both nature and culture) point to the ideal that our mind attains both euphoria and new knowledge while broadening our horizons. Nevertheless, it is still intriguing to engage with: (1) how our visual perception and use of language actually play their games while widening our horizons; (2) how our perceptions of verbal and non-verbal sensory forms converge and diverge in the course of unfolding horizons. This study draws on the discovery that our capacity of perceiving and creating the visual arts is not necessarily dependent on the neuronal pathway of using languages. By way of exploring such symbiotic and non-linear evolution of art and language, this study aims to overcome the opposition assumed to exist between Hegel and Humboldt. It specifically looks into: (1) how their thoughts serve to induce a semiotic model for observing the relationship between our sensation, cognition, and sense of beauty; (2) how such a model enlarges on our consciousness of playing with nature.

Justin William Bernard Sulik (University of Edinburgh)
Cognition at the Symbolic Threshold

The first stage in language evolution was symbolic communication (Jackendoff, 1999). Deacon (1997) calls this 'crossing the symbolic threshold', arguing that our ancestors' representations of communicative events (like those of symbol-trained chimpanzees) were restructured in a flash of insight, forging novel connections between representations.

Approaching the threshold from the opposite direction, inductive inference is assumed to help modern humans develop symbols from initially random strings in cultural-transmission communication tasks (Kirby et al., 2008) and in experiments involving cross-situational learning (Smith et al., 2011).

Problematically, the cognitive abilities surrounding the symbolic threshold, insight and induction, seem to be unrelated, hindering a deeper understanding of how we evolved across that threshold and beyond. Further, Deacon does not provide empirical evidence for the role of insight, something we cannot take for granted given the successes of inductive approaches in this regard. Moreover, inductive accounts typically assume a meaning function, mapping signal to content, which presupposes having crossed this threshold.

I suggest a direction potentially able to solve these problems: shifting our focus from inductive to abductive inference. Peirce (1934) claimed that abduction generates hypotheses as the input to induction, which evaluates them; and that the cognitive mechanisms of insight underlie how abduction produces novel hypotheses.

I identify three features of the ancestral (pre-symbolic) communicative context differing from the context of a modern child learning its first words.
Novel pre-symbolic signals

1. lacked precedent
2. were less predictable from context
3. presume vast hypothesis spaces

I discuss three word-guessing experiments which show that insight and abduction were crucial for each feature. The first (adapted from Fay et al.,2010) investigates the symbolisation of iconic signs; the second manipulates transition probabilities between words; the third manipulates the size of the hypothesis space.

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Len Olsen (East Carolina University)
Pointing a Finger to the Theory of Notation: On the Evolution of Signs and the Search for Meaning

This presentation rests on a distinction between signs and mere objects. The fundamental thesis is that semiosis is an activity that evolves out of the more primitive activity of perception. The

distinction between signs and mere objects was emphasized by St. Augustine; and the first part of this presentation considers the problem of the evolution of signs from by considering Augustine's challenge to Adeodatus in the dialogue *De Magistro.* The central question is whether it is possible to teach someone the meaning of a sign without using other signs. For if we must always use other signs to teach the meaning of a sign, how does the whole project ever get off the ground? Is there an infinite regress in signs and meaning? These questions characterize what I call *the puzzle of the ground of meaning*, and they related directly to the problem of the evolution of signs.

In their own writings, both Peirce and Wittgenstein consider this puzzle. Their solutions to the puzzle differ from the Augustinian solution. Augustine escapes the regress by allowing that not all explanations of meaning involve signs. In certain cases we can explain the meaning of a sign by an appeal to mere things. I call this solution *the retreat to mere things*. Peirce, on the other hand suggests stopping the regress by allowing that some signs contain their own explanation within themselves. I call this *the inherentist solution.* In his later works, Wittgenstein adopts a more conventionalist view of signs, grounding meaning in the behavior that accompanies the use of signs. I call this *the behaviorist solution*.

After setting out *the puzzle of the ground of meaning* and discussing some possible solutions to the puzzle, I will sketch out the theory that pure semiosis evolves out of pure perception.

Lene Rachel Andersen (Independent scholar)

The evolution of the semantic network of a pair of fashionably holed jeans on a historical and an ontological time scale, some possible misreadings by pre-modern semantic networks, and the semantic connections that made holes in jeans go out of fashion only to be re-introduced as cool again later

I make the case that semantic networks are mainly scale-free and that as they evolve and grow more complex over time, historically and ontogenetically, the symbols that evoke the strongest emotions are the ones that have and constantly get the most connections and (thus) carry the most meaning and become semantic hubs in our understanding of the world. I also make the case that in case these hubs are symbols they will be the symbols we seek to have confirmed over and over again, thus making them even stronger. In other words: the very structure of semantic networks defines what we understand and find meaningful and important.

My model of scale-free semantic networks is based on network theory, theory of complexity, child psychology, cognitive science, semiotics and semantics.

The model shows how the structure itself may define how cultural as well as individual creation and use of symbols evolve over time. I use the phenomenon of fashionably holed jeans as a case study to show how a symbol evolves and how and why later it loses its significance. The model reveals some basic mechanisms and conditions for the emergence of new signs and sign systems, it is at work in several levels at once, and it exposes what makes signs themselves emerge, survive and propagate in the context of communication and how and why they may disappear again.

Luis Emilio Bruni (Aalborg University)

On the embeddedness of sign-function

Besides the important evolutionary questions concerning sign-function, it is important to pay attention to the developmental issues involved in synchronous embedded semiotic processes, which will be the focus of this presentation. It is argued that a sound description of such processes needs to challenge a view that adheres to a strictly hierarchical organization, being preferable to opt for a heterarchical approach. It has become customary to consider the distinction between sensing and perception by defining perception as the processes that transform sensation to a representation that can be processed by cognition. The integration, mediation, representation, mapping and translation of information in hierarchical contexts share some of the logical features

of sign-function at different levels; however there are still a lot of problems when trying to draw thresholds of semiosis (or semiotic freedom) in the biological-cognitive hierarchy, e.g. sensing, perception, cognition up to inter-subjective meaning and intelligibility. What is needed is an approach that considers a connection to the processes that are embedded in our focal level as well as the processes that supervene it or are constituted by it. What is important to map in these models of hierarchies is the continuity and/or the causal links implied in the increasing semiotic freedom from the lowest to the higher levels, which is then what determines not only the (evolutionary) transitions from proto intentionality and subjectivity to the full-blown versions, but also the *heterarchical embeddedness* of these levels which are by necessity manifested in simultaneity.

María Restrepo (Universidad de Los Andes, Colombia)
The graphic design production: A sign itself

Graphic Design productions beside visual are cognitive and semiotic, therefore communicational: a powerful cultural creation platform. In these particular design productions: *Graphic Images*, the borderline between texts and images blurs in contribution to an effective visual communication. This dialogue that helps to reinforce the significance possibilities, is pointing at a possible articulation between the linguistic sign and the visual one by the performance of the *Graphic Sign*. A new category of semiotic sign as a result of the encounter of the Iconic Sign and the Plastic Sign in a specific category of images.

Accordingly to this, a new sign that has a structure not independent from the verbal and the visual, but rather one that blends the two, may help to take account of the complex developement of the visual/communicational production in situations that appear before us, so abundant and apparently natural.

Marianela Campos (Aarhus University)
Evolution of Symbols in Contemporary Popular Music and Underground Cultures

Semiotics had studied multiple phenomenon from literature to visual art. Nevertheless, there's not plenty of information about the semiotic scope of the symbols we see daily, spray painted on a wall in the streets we walk down every day. They are not graffiti but simply isolated symbols depicting an ideology, such as a capital A letter inside an O, a five pointed star upside down or the nowadays 'famous' peace sign. Many of these symbols are drawn by young rebel people who belong to what is known as an 'urban tribe' or an underground culture.

Michel Maffesoli in 1985 coined the term 'urban tribe' to point to subcultures and defined them as "microgroups of people who share common interests in metropolitan areas. The members of these relatively small groups tend to have similar worldviews, dress styles and behavioral patterns"1. He quoted punk culture as the typical example.

Urban tribes are mostly linked to some kind of music. They are full of meaning, codes and symbols. They use them to integrate people into the community but also to differentiate themselves from other cultural groups and from the rest of the world. Nevertheless, symbols used by urban tribes are usually old. This means that throughout the years, some symbols remained 'hidden' in some old book until somehow they were re-discovered. After this, their meaning was 'refreshed' by some culture that brought them back to nowadays, giving them a twist, a new variation, a different hue to its original meaning.

The most compelling aspect of this study is the evolution of signs and symbols. This has to do with cultural evolution and social cognition; it integrates Pierce's and Sassure's classic theories about signs, symbols and icons, but it also brings up a new factor that changed radically they way symbols are processed by culture: mass media.

Marilyn Mitchell (Bond University)
A pragmatic perspective on the sign system of genealogical diagrams

This paper discusses the visual sign system of western family tree or genealogical diagrams from a pragmatic perspective, which considers how people use signs to achieve different goals in different contexts. Genealogical diagrams offer a rich area for research into the development and use of signs since they constitute a unique visual representation of time, generational time, that may be graphically multimodal (e.g. containing alphabetic text, numbers, images, etc.), may reflect oral language about genealogy (e.g. in a vertical arrangement, *descendants* typically move *down* the page), and may help people solve particular types of problems (e.g. genealogical diagrams offer people the opportunity to take a long view of their family so as to envision the inheritance of a characteristic such as artistic ability or the likelihood of developing a particular illness). As argued in this paper, the designs of genealogical diagrams may vary according to the intersection of designers' goals, such as whether a diagram is created to honor a family, or as a device for collecting or disseminating information; the context for a design, such as a display on a the wall of a family home or in a book or website; and graphical choices made for a design such as time order (e.g. left to right, centre to periphery), key reference point (e.g. a famous ancestor), page or screen size, and visual variables (e.g. lines, shapes, text, images, color, etc.) selected. The research method for this paper consists of a literature review regarding purposes for genealogical research followed by detailed case studies of genealogical diagrams from early Welsh to current examples. The paper concludes with a taxonomy of diagram variables that designers have selected to achieve different purposes.

Mats Andrén (Lund University)
A Comparative Approach to Conventionality in Gesture

In current research on gesture there is an implicit agreement that it is useful to classify gestures in accord with Peirce's three semiotic grounds: indexicality (deictic gestures), iconicity (iconic gestures), and symbolicity (conventionalized gestures). Nonetheless, even if several prominent researchers (Kendon 2004; McNeill 2005) have pointed out that these different semiotic grounds can be present at once, in a single gesture, many researchers continue to treat them as if they were mutually exclusive. This is problematic because it leads to a tendency to downplay the potential role of conventionality in gestures that are otherwise classified as "deictic" or "iconic". Furthermore, conventionality is often treated in a binary fashion: a gesture is either considered conventionalized, or not. Such approaches to conventionality in gesture miss out on (A) the plurality of ways in which conventionality may be manifest in gesture, and (B) the fact that there can be conventionality to different *degrees*. With respect to the latter I will argue that it is more useful to treat the issue of "degrees" in terms of various *levels of conventionality*, rather than thinking of it merely as a continuous scale, because the levels highlight some of the qualitative differences that emerge along the way in the process of conventionalization. The levels that I will argue for, and elaborate on, range from less conventionalized to more strongly conventionalized (cf.Andrén 2010). They are: (1) *normality*, (2) *typification*, and (3) *normativity*. The levels build on each other, and can therefore be usefully applied to developmental research questions, in human evolution, cultural history, and in children's development. My own work has been focused on development of gesture in children from 18 to 30 months (Andrén 2010) and I will show concrete examples from this data to ground and exemplify my arguments.

Peer Bundgaard & Svend Østergaard (Aarhus University)

What are text genres? The double feedback loop and the parameter theory of genres

This presentation has a double scope. First, we consider the dynamics inherent in the emergence of genres. Here we champion the view that genres emerge relative to two sets of constraints, which we aim to capture in our double feedback model. On the one hand genres emerge out of or as transformations of already existing text types. On the other hand, genres develop as a response to the negative or positive properties of given situations; that is either the exigencies of the situation or the new resources available in a situation. The first part of our talk is devoted to a characterization of situations and of the dynamic relation between situational constraints/potentials and genres. Our main claim is that situations and genres stand in a relation of mutual scaffolding to each other so that a text type is not simply caused by the exigencies proper to a given situation, but, once emerged, also feed backs into the situation, further stabilizing or consolidating it. Hence the use of the term "feedback loop". The second part of our talk consists in developing a descriptive apparatus consistent with the dynamic approach to the emergence of genres. This is our parameter theory of genres: here we consider genres as governed by parameters external to them and intrinsic to the situations they are dynamically related to. Genres should thus be understood, not simply in terms of inherent textual or formal traits, but also relative to certain sets of situational parameters and relative to the degree to which they are governed by them.

Peter Bakker (Aarhus University)

New languages: cognitive aspects of emerging grammars

Creole languages and sign languages could be said to be languages created in a bottom-up fashion.

Most sign languages were created in communities where deaf people gathered, such as schools for the deaf, even when the use of signs was discouraged or even forbidden by the schools. The sign languages were created from scratch, in some cases expanding limited home sign systems. They were transmitted to new generations through the schools. Furthermore, 90 % of deaf children have parents who are not deaf, which means that the children are better at sign language than their parents. Pre-adolescents created the grammatical structures of these languages.

Creole languages emerged in situations of language contact where different language groups had to develop a new means of communication because of a lack of a common language. In the first stages these communication systems were limited (sometimes called jargons or pidgins), and used by adults. Social circumstances such as nativization or vernacularization led to the structural expansion into what is called a creole language: a full language with new grammatical structures. Evidence is now accumulating about the fact that creoles, lexically based on languages such as Arabic, Dutch, English, French, Malay, Portuguese And Spanish, share a set of grammatical properties that show that they are fully natural languages, like the other languages of the world, but they are structurally remarkably distinct from the non-creoles.

It has also been suggested by scholars such as M. Deuchar, J. Gee & W. Goodheart and S. Fischer that creoles and sign languages have many semantic-structural properties in common.

In our paper we discuss the cognitive processes that are apparently so deeply rooted that they lead to overt shared structural properties in new languages, both signed and spoken.

Peter Musaeus, Søren Læssøe Mathiesen & Mads Ronald Dahl (Aarhus University)
The semiosis of students' conceptual understanding of biochemistry

University students' learning of scientific concepts can be described as a process of semiosis at three different levels: Ontogenetic, whereby students over time actively acquire signs that represent new meaning to themselves; mesogenetic, whereby a teacher through teaching an dialogue activities together with students build conceptual understanding; sociogenetic, whereby the scientific achievements of a science disseminate into the classroom. Semiotic processes have been investigated in educational semiotics (Cunningham, 1992), sociocultural psychology (Valsiner, 2007) and research on math and science students' diagrammatic reasoning (Hoffmann et al, 2005; Radford, 2000). This study builds on these traditions in order to explain students' learning of biochemical concepts and specifically the mediating role of threshold concepts in students' learning over time. Threshold concepts are concepts that are central to a subject and subsequently to a persons' grasping of a scientific subject (Meyer et al, 2006). Because threshold concepts are thought (metaphorically speaking) to form a portal through which the student steps once these concepts are mastered, they have begun to be used in planning university teaching including biochemistry teaching (Loertscher, 2011). The study seeks an answer to the problem of emergence in science students' acquisition of concepts, not only how students' form new sign hierarchies over time, but how say easy concepts suddenly change into a hard concepts(or vice versa) as new signs are appropriated by students? Why are biochemical structures easier to grasp than processes? Illustrations are provided from a case deriving from a mixed-methods longitudinal study of odontological university students' (N=50) biochemical conceptual understanding. Students' ratings (on visual analogue scales) of biochemical concepts were collected every week during a university semester. Archival data (e.g. biochemistry textbooks), diaries and a qualitative interview were collected with a biochemistry teacher. Methodological challenges are identified in studying conceptual change and the applicability of semiotics is discussed.

Piotr Konderak (Maria Curie-Sklodowska University in Lublin)
On "mutual enlightment" of Cognitive Semiotics and cognitive modeling

Accepting Zlatev's characteristics of cognitive semiotics – as a discipline combining methods and theories from cognitive science and semiotics in investigations of the concept of meaning, I must notice that Zlatev consequently neglects the role of cognitive modeling in explaining the phenomenon of meaning. In my paper I want to indicate the actual contributions of cognitive modeling to the semiotic theory(ies), showing that such an approach may not only describe (cf. phenomenology), but also **explain** some of the semiotic processes.

The relationship between semiotics and CS evolved in time. From Fetzer's (1997) notion of a computer as a sign, via Godwin's *computational semiotics* (being in fact applied semiotics) to the notion of an artificial cognitive agent (ACA) of a semiotic system.

The key idea of cognitive modeling is to look for the answers by investigation of functioning cognitive models. My model of GLAiR-based NL-using system allows to elicit and explain mechanisms of functioning and development of (selected) sign systems:

- the distinction between interpretability and actual interpretations (Fetzer), which indicated the role of embodiment in modeling semiotic systems;

- dynamic character of meaning: the interpretation of signs involves reorganization of a knowledge base. In consequence meaning of any sign is to be understood as a process (cf. Quinean holism);

- the course of the process of re-interpretations of signs, esp. in the context of conflicting (e.g. contradictory) interpretations of signs;

- although some researchers claim that ACAs are not appropriate models of human sign-interpreting beings living in their world, such ACAs may turn out to be apprpriate to explain the processes of semiosis in virtual/simulated worlds;

- finally, the possibility of meta-semiotics in artificial cognitive systems (the possibility of building an explicit theory of a system as a sign-using system) can be addressed.

Salmiah Abdul Hamid (Aalborg University)
Intersections between Geosemiotics and Human Mobility in the Study of Road Traffic Signs

Based on my ongoing PhD research project, this presentation explores the intersections between geosemiotics and human mobility in the study of road traffic signs. Many research studies in urban environment and traffic engineering focus on the human behaviors and traffic sign system recognitions. However, there are gaps in the literatures in regards with signs in place and the mobility of people within an urban space in their daily life experiences. Scollon and Scollon (2003) have explored the physical and placement of signs system which contributed to meanings in everyday life. Büscher and Urry (2009) on the other hand, examine the embodied mobility experiences of everyday life activities through mobile methods. In my present study, the methods used are observations and focus group discussions. However, this presentation focuses on the results and analysis of the focus group interviews. The results discuss some of the geosemiotics and mobilities aspects in everyday life of the participants in relations to road traffic signs in the urban settings. Place semiotic is one of the geosemiotic aspects inspired from Scollon and Scollon that was used in the research process. Activities and mobile methods such as drawings of travel journey maps and manipulated photos of traffic signs were integrated into the focus group discussions. These tools were used to unpack the participants' everyday life social behavior within an urban environment in an unnatural setting. This study invites discussion on the importance of geosemiotics and mobilities approach in investigating people's travel behavior and the relationship with the urban environment. The anticipated outcome of this analysis will help to determine the relevance methods used in this research project which can contribute to future research in the field of urban planning and visual communication.

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Vikash Kumar (Jawaharlal Nehru University)
"Revolutionary Roads: Violence versus Non-violence - A comparative study of *The Battle of Algiers* (1966) and *Gandhi* (1982)"

Considered one of the finest realist films ever which reconstitutes perfectly the revolution by the people of Algeria, *The Battle of Algiers* (Pontecorvo Gillo, *La Bataille d'Alger*, Igor Film, Italy, 1966) presents us an image of a world of anger and agony. The making of *The Battle of Algiers* possibly heralded the birth of Algerian cinema as it was the first film made just after their independence. In fact, this cinematographic masterpiece reveals to its viewers a plethora of images depicting the Algerian people in their quest for independence. Made in the year 1966, by Gillo Pontecorvo and based on the personal experiences of Yacef Saddi, Military Head of the FLN who also collaborated on the script of the film, *The Battle of Algiers*, interestingly, was directed with the aim to highlight the

invisible aspects and unheard voices of this violent revolution by the people of Algeria as well as the counter measures taken by the colonial power to suppress the movement.

Similarly, Attenborough's film *Gandhi* (Attenborough Richard, *Gandhi*, Columbia Pictures, India/ U.K, 1982) made with the financial, logistical and political support of the Government of India during Indira Gandhi's rule depicts on celluloid using a largely Indian cast and crew, the story of Gandhi, and India's independence through non-violence. The film presents a screen history of India, by giving us an account of the life and struggle of Mahatma Gandhi.

The principle of non-violence prevails everywhere in this film. The whole philosophy of Gandhi is based on this principle which is depicted as a tool through which a revolution can be launched and won. The film opens numerous sequences depicting Mahatma Gandhi's non-violent struggle for dignity in South Africa. In this context, a noted Gandhian scholar, Anil Nauriya says: "Gandhi drew inspiration not only from his experiences in South Africa but also from his reading of the history of Africa as a whole."[1] Thus, we observe that during the entire non-violent freedom struggle of Mahatma Gandhi in India, Africa was dominant in his mind as his early struggle for equality was initiated in Africa, a matter which prompts us to explore the influence and confluence of the independence struggle of one country on another in this article. We equally perceive that despite conspicuous dissimilarities in both the films regarding the medium of struggle i.e. violence in *The Battle of Algiers* and non-violence in *Gandhi*, they are interconnected; and the two different nations achieve independence through two entirely different revolutions. We also feel that there exists a parallelism on the theme of the suffering of the colonized versus the oppression of the colonizer in *The Battle of Algiers* and *Gandhi*. In the two films, we feel that the underground guerilla revolution by the Algerian people in *The Battle of Algiers* shares resemblances with the over-ground political revolution of the Indian masses in *Gandhi*. Nevertheless, through the analytical re-reading of the two films from the perspective of an Indian scholar born in the postcolonial era, one attempts in this article to appreciate the attempts of the two film-makers, to rewrite History, and to write back to the Empire.

[1] NAURIYA Anil, *The African Element in Gandhi*, Gyan Publishing House, New Delhi, 2006. p. vii.

Vytautas Tumėnas (The Institute of Lithuanian History)
Patterns of Geometric Diagonal Ornament: Historical Transformations of Signification from Baltic Perspective

The paper analizes the tradition of diagonal geometric ornament popular in North and East European folk textile, especially in Baltic sashes (belts). This ornamentation is widely spread in Eurasian, Native American, and North African cultures. At the same time this ornament has strong association with the concept of national identity in modern world.

This presentation aims to determine an interconnection of the national and universal aspects of diaginal ornament from evolutionary perspective and to outline the basic peculiarities of this particular type of ornament form and significance. The main tasks are to rewiew the historical traces and evolution of their form and meaning as well as modern, contemporary interpretations of this tradition in Baltic cultures; to analize the basic mutable, creative aspects and constant elements of this tradition.

The author investigates the essential changes of this ornament from ideograms and proto-script in Old Europe civilization to magic signs-symbols as part of mythologic world and later – into element of traditional folk worldwiev, and in modern times – to symbolic elements of national identity or aesthetics and reconstructed signs-symbols of mythological tradition and actual interpretations in contemporary antimodern ideologies. A narrative aspect of these signs is very important for the vitality of tradition – therefore pecularities of traditional folk denominations in Baltic and Slavic dialects and their meaning hypothetically reconstructed by ethnosemiologic investigations are taken into account.

This mutable ornament tradition has certain important constant elements. From the oldest times these signs were not linked with one particular technology. On other hand textiles, woodcraft and ceramics was fundamental medium for their elaboration during the ages. The diachronic changes in meaning of their archaetypal signs are strongly associated with ideology and social ideals transformations. Contemporary revival of this ornament in Baltic countries is strongly based not only on traditionalism, but also on universalism paradigmas.

Waldmir Araujo-Neto & Rosangela Silva (Federal University of Rio de Janeiro & Federal Institute of Technology of Rio de Janeiro)

Semiotic aspects on the sign evolution of chemical structural representation between the late nineteenth and early twentieth century

Chemistry has been using a specific mode of communication for representing molecular entities as organized in space. The literature considers that these representative forms were created within the chemical as a consequence of a "semiotic turn" in 1950 proposed by Derek Barton (1918-1998) and Vladimir Prelog (1906-1998)[1]. However, we believe that this process of development of signs has a specific semiotic nature, not yet considered in such studies, historically and culturally determined, being the result of an extensive process of disputes and conflicts. Here we present the first results from a proposed semiotic study of a set of signs committed to the representation of spatial arrangement and topology of molecular entities, between the late nineteenth and early twentieth century. Our theoretical framework considers the Philosophy of Symbolic Forms of Ernst Cassirer to read the different representative modalities over this period, which historically marks the beginning of stereochemistry. We take to review the images produced by eight chemistry scientists involved in the production and disclosure of signs, as a means of representing the organization of chemical entities in space, during the period of 1874 and 1924. Our results point to the occurrence of the three types of symbolic forms (eg expressive, representative, significantive), with greater evidence for the region between the expressive and representative modes of action (semiosis) of the symbol. The methodological framework of the study relates intrinsic symbolic elements of each sign with an analysis of the discourse used by each scientist during the presentation of the symbol. We believe our study indicates, among other things, that those semiotic elements present in the signs proposed by the so-called "semiotic turn" were already contained in the semiosis of the signs of our studied period.

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Werner Schäfke (Albert-Ludwigs-Universität Freiburg)

Challenges and Methods of Cognitive Historical Lexicology of Old Norse

The case of vinfengi

Old Norse is the best attested Old Germanic language. There are, however, only few lexicological studies on Old Norse other than purely lexicographic works. And the lexicographic works usually do not take into account that most of their material is of a literary nature, and the meaning of their lexical items thus is also influenced by the literary text as a secondary modeling system. Furthermore, the small number of individual studies that have reconstructed individual notions, confined themselves to a single literary work (Marold 2000; Byock 1988). Both approaches to Old Norse lexicography – the lexicographic and the cultural studies' approach, do not sufficiently describe procedural semantics. There is thus a need for an integrative methodology that allows at reconstructing notions in both literary and non-literary texts, both in their "static" (i.e. lexical)

semantics and their procedural (script) semantics. This paper presents such an integrative method that reconstructs Old Norse notions within the frame work of cognitive semantic combined with literary semiotics. The test case for demonstrating this methodology is the *Wortfeld* of *vinfengi/ vinátta* that is usually, and rather misleadingly, translated as "friendship".

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ABSTRACTS

EXPERIMENTAL SEMIOTICS

NASS VIII Theme Session:

Experimental approaches to cognitive semiotics

Organizers:
Göran Sonesson, CCS, Lund University
Kristian Tylén, CfS, Aarhus University

In relation to classical semiotics, cognitive semiotics offers at least three new elements: it focuses on the subject and its abilities, and not only on the resulting artefacts and structures; it furnishes non-semiotic concepts to mediate and integrate the semiotic ones; and it (partly) relies on methodological toolkits from psychology and cognitive sciences such as the experimental method.

The present section will be concerned with experimental approaches to cognitive semiotic questions - a rather new and unexplored field, with classical exceptions such as Lindekens and Krampen. However, it should not be forgotten that Peirce himself used experimental methods during a period, though hardly to address what to us may seem central issues of semiosis.

The six papers making up this thematic session concern a number of experimental studies of semiotic phenomena, including pictorial abstraction and ambiguity, temporal organization in film, conceptual structure in gesture and coordination in dialogue.

Contributors:

Daniel Barratt & Anna Cabak Rédei (Lund University): *Does the Kuleshov effect really exist?*

Göran Sonesson & Sara Lenninger (Lund University): *The Mirror Image, the Video Clip, and the Real World. A Study in Experimental Semiotics.*

Gregory Mills (University of Edinburgh): *Making and breaking procedural conventions: partner-specific effects*

Kristian Tylén & Riccardo Fusaroli (Aarhus University): *Neurocognitive trails of collective meaning construction*

Monica Tamariz, Gabriella Vigliocco, David Vinson & Julio Santiago (Universidad de Granada & University of Central London): *The emergence and spread of iconicity*

Peer Christensen & Kristian Tylén (Aarhus University): *Representing event structure in gestural communication*

Peeter Tinits (University of Edinburgh / University of Tartu): *Application of semiotic experiments in linguistic research*

Daniel Barratt & Anna Cabak Rédei (Lund University)

Does the Kuleshov effect really exist? Revisiting a classic film experiment on facial expressions and emotional contexts

In the early 1920s, the Soviet filmmaker Lev Kuleshov conducted an experiment that has become part of the mythology of film history. Legend has it that Kuleshov combined a close- up of the Russian actor Mozhukin's neutral face with a variety of different emotional contexts, including a child playing with a doll, a dead woman in a coffin, and a bowl of soup; the viewers of the three sequences were reported to have perceived Mozhukin's face as expressing happiness, sadness, and hunger/thoughtfulness respectively. It is not clear, however, whether or not the so-called "Kuleshov effect" really exists. Kuleshov's original film footage is lost and two recent attempts at replication have produced either conflicting or unreliable results.

The proposed paper describes an attempt to replicate Kuleshov's original experiment using an improved experimental setup. In a behavioural and eye-tracking study conducted by the authors, 36 participants were each presented with 24 film sequences. Each film sequence comprised an image of a person's neutral face, followed by an image of an object/event, followed by another image of the person's neutral face. In line with Kuleshov's original experiment, we included happiness, sadness, and hunger/neutral conditions with equivalent stimuli. For each film sequence, the participant was asked: to rate the valence of the depicted person's emotion; to rate how aroused the person appeared to be; and to identify the type of emotion that the person was feeling. The participant's eye movements were recorded throughout the experiment using a remote eye-tracker (SMI iView X RED). A preliminary analysis of the results suggests that some sort of Kuleshov effect does in fact exist. For the different emotional conditions, the participants tended to choose the appropriate emotion more frequently than the alternative options. The answers to the valence and arousal questions also went in the expected directions.

Göran Sonesson & Sara Lenninger (Lund University)

The Mirror Image, the Video Clip, and the Real World. A Study in Experimental Semiotics

Children, just as adults, may come to know about the state of the real world by means of direct perception, or by employing indirect means, i.e. signs, such as pictures, movies, scale- models, or mirror images. We know a great deal about how children come to understand signs which are not only indirect but also largely conventional, such as words, but the ontogeny of iconic signs is little known. Apart from Judy DeLoache's pioneering investigations into children's understanding of pictures and scale-models, there have only been a few studies comparing the interpretation of video clips and real perception referring to the same event. Mirrors have mostly been addressed in psychology as a means of acquiring self-recognition. Within semiotics, however, Umberto Eco has argued that mirror images are exactly like perception, but theoretical arguments have been opposed to these claims. In the present experiment, we compare real world perception, recorded video clips, directly transmitted video, and mirror images, using an object choice task. According to preliminary results, two-years olds are almost as good at understanding the task when the information is conveyed by directly transmitted video as when it is given in perception, and they have considerably more difficulty accomplishing the task when the information is conveyed either through pre- recorded video or through mirror images. This seems to show that continuity (i.e. indexicality) between the sign and its referent is more important to small children than sign character, but it also suggests that the mirror image is far from being identical to perception, at least from the point of view of development.

Gregory Mills (University of Edinburgh)
Making and breaking procedural conventions: partner-specific effects
A key problem for accounts of signalling systems is to explain how coordination is both achieved and sustained. Existing accounts emphasize the importance of interaction, demonstrating how collaborative feedback leads to the rapid development of referring conventions that are also more systematized, stable, abstract and partner-specific.

However, in addition to co-ordinating on the content of referring expressions, establishing a signalling system also requires procedural co-ordination: interlocutors must co-ordinate on the sequential and temporal unfolding of their contributions. Recent work has demonstrated that interlocutors also rapidly establish procedural conventions for identifying, signalling, and resolving procedural co-ordination problems that they encounter in the interaction. It is currently unclear, however, whether interlocutors associate these procedural conventions with specific conversational partners.

To address this question, we report a collaborative 3-participant computer-mediated task which presents participants with the recurrent co-ordination problem of ordering their actions and utterances into a single coherent sequence. The task is configured so that each participant has a different interaction history with both of the other two participants, resulting in each participant encountering different procedural co-ordination problems with both partners.

To investigate partner-specific effects, all participants' turns are intercepted automatically in real- time, permitting experimental manipulation of their content and timing. This technique is used to generate artificial clarification requests that query the procedural function of participants' turns. The apparent origin of these clarification requests is manipulated to appear as if they originate from either of the 2 other participants.

We demonstrate that participants' responses to these clarification requests provide evidence of interlocutors associating procedural conventions with specific partners, and, drawing on global interaction patterns in the task, we also argue that these partner-specific effects are sensitive to the specific sequential location in the dialogue where problematic understanding is signalled.

Kristian Tylén & Riccardo Fusaroli (Aarhus University)
Neurocognitive trails of collective meaning construction
Human societies are embedded in a network of material structures for social interactions. From conventional road signs to creative works of art, objects gain meaning that come to guide and constrain social sense-making. However, how do objects become imbued with meaning? And which are the neuro-physiological underpinnings of it? In this study we used a combined behavioral and neurophysiological experimental paradigm to explore the effects of explicit social negotiation of meaning. We instructed individuals and groups of participants to literally construct LEGO models of abstract notions such as "trust", "safety", and "team work". Subsequently, participants were brain- scanned using fMRI while they saw photographic pictures of the LEGO models they themselves or other participants had made individually or collectively with their group. In the scanner, they solved tasks relating to the meaning, intelligibility and physical properties of the models, which allowed us to assess patterns of brain activation associated with different aspects of object perception and sign interpretation and how it is modulated by the collective/individual history of the objects.

Monica Tamariz, Gabriella Vigliocco, David Vinson & Julio Santiago (Universidad de Granada & University of Central London)
The emergence and spread of iconicity

Iterated learning experiments, where the output of a generation is the input to the next, amplify and thus help reveal the effects of weak cognitive biases on culturally transmitted systems [1]. We use this paradigm to investigate whether iconic signs are more likely to be created and transmitted than non-iconic ones and, if so, what is the role of learning and usage in this advantage.

We used artificial languages that designated the twelve objects (Fig.1). The labels were neutral in terms of spikiness/roundness (as per norming study). Initial languages showed no significant systematicity.

In the *learning* condition, one participant was trained and then tested on a language. Her output was the training language for the next participant.

In the *communication* condition, two participants sitting at separate computers were trained on a language, and then they played a communicative game. The labels produced by one pair were the training language for the next one. We ran four chains of six generations in each condition.

We measured the systematicity (Mantel test [2]) and the iconicity (with a norming study: people rated how good a word was for a spiky/rounded, or a red/blue/green or a bordered/borderless object). The main findings were:

- Overall **systematicity** increased over generations, as expected [2]. This was driven by regularities between labels, on the one hand, and shape and colour, but less so border of their referents, on the other.

- The emergent regularities between labels and *shape* (but not colour or border) were **iconic.**

- These effects were significantly stronger in the **communication** than the learning condition.

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Peer Christensen & Kristian Tylén (Aarhus University)
Representing event structure in gestural communication

The motivation for conceptual structure in language and cognition is a hotly debated topic. Gesture is a particularly interesting window into conceptualization due to their affordances for spatial, iconic and symbolic representation and how they unfold in time. Previous studies have indicated that people of any linguistic background tend to use only one specific gesture order (SOV – subject, object, verb) when asked to describe transitive events by hand gestures alone (e.g. Goldin-Meadow et al. 2008). This is presented as evidence for innateness of the conceptualization of events, thus transcending acquired linguistic structure. However, a competing explanation not considered in the literature is the extent to which responses are influenced by the logical order, or event structure of the referent situation itself. Some types of 'transitive' actions thus logically depend on the existence of the object, while for others – such as 'construction activities' - the object emerges as a product of the activity. We will present data from an experiment in which participants engaged in a dyadic referential game involving the match of stimulus pictures using only gesture as a communicational medium. Results suggest that the event structure of the referent situations indeed has a profound impact on the order in which individual gestures are performed. Simple transitive situations (e.g. 'a ballerina throwing a paper plane')

motivated an order analogous to the SOV- order in language, while construction events (e.g. 'a ballerina painting a paper plane on a canvas') motivated SVO-type gesture strings. The results will be discussed in relation to motivations for conceptual structure in language.

Peeter Tinits (University of Edinburgh / University of Tartu)
Application of semiotic experiments in linguistic research

The newly emerging field of experimental semiotics (Galantucci & Garrod, 2011; Scott-Phillips & Kirby, 2010) that investigates the development of semiotic systems under experimentally controlled conditions has demonstrated this development to often follow domain-general principles. Thus for example, in investigating the evolution of natural language, it has been shown how systematicity can arise in communication of dyads independent of arbitrariness (Theisen et al., 2010), and how repeated mixing among these dyads can select for graphic signs easier to draw, and easier to recognize by both trained and untrained participants (Fay et al., 2010). While these studies have provided much insight, it is argued that linguistic evolution can follow different constraints at times. Referring to aforementioned studies, for example, it is difficult to dissociate the ease of understanding from the ease of drawing, while also the cultural conventions of images can provide different opportunities to develop systematicity than linguistic forms.

Combining experimental semiotics with artificial language learning (Kirby et al., 2008), a study was performed to adapt the field better to historical linguistics. Thus, in order to provide pre-established linguistic conventions to support communication, the participants were pre-trained on miniature languages differing on two items. They took turns speaking in groups of three (consisting of minority and majority speakers), and the solutions they used to establish successful communication were monitored. By contrasting two groups, a bias was detected to prefer systematic forms to idiosyncratic ones in these languages (cf. Fay et al. 2010, although the closed group points to a different justification). Although the sample size (N = 18) is enough only for a pilot study, if followed up this result can find practical application in investigating the proximal mechanisms involved in linguistic contact. The aim of the presentation is to introduce an experimental method by which it could be done.

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SIGN EVOLUTION ON MULTIPLE TIME SCALES

ABSTRACTS BIOSEMIOTICS

growth icon sign systems multimodality cognitive-semiotic symbol Transitions modality factors key engine language bodily cells alloparenting understanding Semiotics discovery evolution Experimental mimesis speak human language: Creating signs homesign communication Three manual creole

NASS VIII Theme Session:
Biosemiotics: Biosemiotic Perspectives on Sign Evolution and Development
Organizers:
Kalevi Kull, University of Tartu, Estonia
Riin Magnus, University of Tartu, Estonia
Timo Maran, University of Tartu, Estonia

In biosemiotics the views on sign evolution and development are not unified but rather diverse, ranging from structuralist and typological stance to semiotic mapping of evolution mechanisms, from gradualist hypotheses to punctualist models. In this session we attempt to unify the understanding of both intraorganism and interorganism communication via the common semiotic models, while bearing in mind also the specifics of semiotic processes that take place on different levels of biological organisation. Considering the role of learning in evolution (as emphasized by J. M. Baldwin), we are going to ask about the role of the mechanisms of learning in sign development and evolution. Thus we expect to reformulate the more common descriptions of the evolution of biocommunication in terms of sign development and evolution in contexts. Aspects like the dynamics of semiotic scaffolding, interspecific relations and the organization of animal societies could be of interest in this session. The session aims to cover theoretical perspectives as well as case-studies on the above mentioned subtopics.

Contributors:
Kalevi Kull (University of Tartu): *Evolution of signs as evolution of types of learning: Emonic signs between index and symbol*

Mette Miriam Rakel Böll (Aarhus University): *Brain, Body, Behavior: Integrative Semiotics*

Morten Tønnessen (University of Stavanger): *The ontogeny of the embryonic, fetal and infant human Umwelt*

Riin Magnus (University of Tartu): *The development of sign usage in the cooperation of the blind person and guide dog team*

Sebastian Gaub (Technical University of Kaiserslautern): *Semiogenesis: The Epigenesis of Semiosis*

Søren Brier (Copenhagen Business School): *The expanded ontology of Peircean biosemiotics*

Kalevi Kull (University of Tartu)

Evolution of signs as evolution of types of learning: Emonic signs between index and symbol

Since anything becames a signs via certain learning‑‑‑type process, the major typology of signs depends on the types of the mechanisms of learning. Thus, also, the macroevolution of sign types can be understood in correspondence to the evolution of mechanisms of learning — beginning from the cellular level. We distinguish between four general types of learning which correspond to four main taxonomical types of signs, called icons, indexes, emons, and symbols. Emons are acquired via imitation or social learning, and exist in animals with emotions. Distinction between icons and emons solves the paradoxical usage of the sequence index–icon–symbol (instead of the original icon–index–symbol) in some earlier semiotic theories.

Søren Brier (Copenhagen Business School)

The expanded ontology of Peircean biosemiotics

Recent critique of Terrence Deacon's biosemiotic synthesis by philosophers of mind Fodor and McGinn urges us to reconsider our paradigmatic stipulations in biosemiotics. My suggestion (Brier 2010) is to enlarge our concept of reality with the living systems, the social/intersubjective systems including sign games and language games and various sorts of culture and finally the subjective/experiential world of embodied consciousness. Such a transdisciplinary view challenges our grand evolutionary narrative that by starting with energy, information and force wants to build up an *explanation* of the emergence of mind, though I do not see any basis for doubting the irreversibility of manifest time. But physical, living, social and experiential time seems to differ qualitatively. Peirce addresses the problem that our knowledge starts from our abductive interpretive productions of explanatory signs on the basis of perceptions, which then produces our inner world of consciousness and theories of the world. He actually calls our self a symbol that grows as we gather more knowledge and rearranges it. His other ontological stipulation is the cosmos is a huge argument. Thus the sign process seems to be the connection between object, subject and the intersubjective, in where communication and theories are manifested. It seems that we need to find a way to insert the meaningful sign production deep into the foundation of our irreversible time process ontology, where knowledge seems to be a product of evolution, history and personal experiential ontogeny. At least it is important to acknowledge that the world is not an object, because we are part of it ourselves always and already, no matter what kind of knowledge project we are embarking on. Thus explanations based on an ontology viewing the world as a developing object producing us are inconsistent for a transdisciplinary understanding.

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Sebastian Gaub (Technical University of Kaiserslautern)
Semiogenesis: The Epigenesis of Semiosis

A whole series of genomic and epigenetic findings of the last 10 years in- dicates the existence of previously unknown types of the origin of biological information. Besides processes such as DNA methylation and histone modifi- cations relating to the expression of the genome, there is also evidence for the effect of DNA methylation on the DNA sequence itself. Together with already known mechanisms such as the retrotransposition these findings open a new perspective on the emergence of biological information.

The present innovation theories range from physical mutation theories to statistical theories that describe the population dynamics by means of variation and selection and finally to developmental (systems) theories of in- novation. The totality of these theories is indeed able to describe dynamics in simple biological systems, but can not deal with more fundamental antino- mies of the New: These antinomies include at least the antinomies between superficial and profound change, between relative and absolute novelty and between continuous changes and discontinuous breaks/events.

In contrast to previous theories a biosemiotic theory can dissolve these antinomies, because the usage of a triadic model of information has no con- ceptual need for these kinds of dualism. Key properties of molecular minimal semiotic systems such as specificity, self-referentiality, temporal asymmetry and relational symmetry are crucial benefits of a biosemiotic innovation model.

Using these key properties of molecular semiosis, the proposed bio- semiotic innovation model is able to explain the epigenetic prerequisites of semiogenesis. The model shows, how evolution takes place by contextualisa- tion and hierachization of molecular semiosises. Logical approximations are included and indicate that semiogenesis take places above a pure biochemical level (in time and space).

Concluding the argumentation, semiogenesis is an open and inclusive process that is accessible to biological survey and enables new questions and perspectives on (molecular) evolution.

Mette Miriam Rakel Böll (Aarhus University)
Brain, Body, Behavior: Integrative Semiotics

This talk will guide an investigation from Anthony Damasios somatic marker hypothesis (Damasio 1991), through Jesper Hoffmeyers redefinition of these markers as semiotic (Hoffmeyer 2008) and relate the two to a "brain, body, behavior" - model of human sense - making. Both evolutionary and biological aspects will be unfolded and discussed with a primary focus of integrating the semiotic perspective in an understanding of such research areas as empathy, social interactions and meaning in both contemporary neuroscience and biosemiotics.

Keywords: *Biosemiotics, Neurosemiotics, Ethology, Social Relations, Empathy*

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Morten Tønnessen (University of Stavanger)
The ontogeny of the embryonic, fetal and infant human Umwelt
In this presentation I will outline the three first stages – namely the embryonic, fetal and infant stage – of the lifespan of our subspecies *Homo sapiens sapiens* in Umwelt terms. Umwelt transitions, defined as lasting, systematic changes within the life cycle of a being from one typical appearance of its Umwelt to another, will be identified. Comparison will be made with the general, shared Umwelt of mammals (Mammalia). This enables us to pinpoint some uniquely human developmental traits.

In terms of the tripartite Umwelt model, the presentation will cover the early development of the *core Umwelt* and the *mediated Umwelt,* and the emergence of a *conceptual Umwelt.* The designated phase of human development envelops the gradual emergence of various senses, the emergence and fine-tuning of Umwelt objects, early phases of human individuation, and early sociality.

Birth, an individuation event *per se,* arguably represents the most significant of all Umwelt transitions at the individual level. But by that point the more-than-human Umwelt gradually becoming human has already developed for some nine months. What is it like to be an embryo? What is it like to be a fetus? In the womb, the Umwelt of the embryo and later the fetus is intimately tied to that of the mother. Which, then, is the most useful term in this analysis – communication (between the two), or auto-communication (within the whole that is the pregnant woman)? At any rate the mother is the progeny's first landscape – the mother's body represents Earth, nature, as first perceived. Human sociality, furthermore, emerges gradually, starting in the fetal stage, perhaps when the voices from beyond our first landscape are first heard and engaged with. We start interacting with others long before we become aware of who we are.

Riin Magnus (University of Tartu)
The development of sign usage in the cooperation of the blind person and guide dog team
The signs that the guide dog and blind person team uses for communication do not vary just from task to task or from situation to situation, but they change also in time, as the cooperation of the team develops. The signs used by the guide dog host change as she/he learns to accommodate his/her behavior to the dog's sensibility, to its preferences for communication channels, to the typical objects that divert the dog's attention from work as well as to the specifics of the environment, where the tandem is usually moving. Based on interviews with guide dog users from Estonia, Germany and a few other countries as well as participatory observations of the teams' work, I will enlist the following elements of communication that are subjected to change as the cooperation of the team evolves: the mode of communication; the quantity of signs; the type of communication channel; the characteristics of a signifier; the ratio of discrete and non-discrete signs; the speed of comprehension; extension of the communication act. In my talk, I aim at exploring how do those modifications of communication relate to the changes in the perception of the environment and to the shifts in the umwelten of the two subjects.

SIGN
EVOLUTION
ON MULTIPLE
TIME SCALES

ABSTRACTS
DYNAMICAL SYSTEMS

text Actions
behavior process systems Hearts Bea
time dynamics Words Three
go-model-constructing constraint- mechanisms
biological three five scale
reading reveal Understanding slow one
comprehension become working
people system

NASS VIII Theme Session:

The stability of signs: dynamical approaches

Organized by Riccardo Fusaroli, CfS, Aarhus University

Signs develop and stabilize at a surprising variety of timescales - from seconds to millions of years. From a dynamic perspective, the stability of signs stands out as a special challenge - how is it possible for dynamical systems, quickly varying over time, to preserve and make use of signs whose stability may outlast not only individual organisms and situations, but also societies and even species?

In this mini session we will discuss dynamical approaches to the stability of signs in a variety of contexts: evolutionarily developed biological mechanisms (Østergaard), the stabilization of coordinative patterns and routines in joint action (Fusaroli & Tylén) and in text comprehension (Wallot). In all contributions there will be a special effort in discussing the dynamical framework and its implications.

Contributors:

Sebastian Wallot (Aarhus University): *Understanding as a constraint on behavior: The dynamics of reading reveal a slow process in text comprehension*

Svend Østergaard (Aarhus University): *Three mechanisms in biological systems working on three time scales*

Riccardo Fusaroli & Kristian Tylén (Aarhus University): *Words, Actions and Heart Beats: how five people become one Lego-model-constructing system*

Svend Østergaard (Aarhus University)

Three mechanisms in biological systems working on three time scales

In this paper I consider self-organizing biological systems. I consider a biological system as consisting of a (large) number of entities that exhibit behavior and where the behavior of a single entity at any given moment is determined by the history of the system up to this moment. Such systems have three properties: 1) there is a diffusion of behavior in the system due to one or more (positive) feedback signals. 2) The signals are necessary to maintain the behavior, i.e. if the signal fade the behavior disappears. 3) The signal can be "saturated" which also lead to a change in behavior. The fading and the saturation leads to the same result, but for different reasons. The signal fades because the behavior is not beneficial. It gets saturated for the opposite reason: the behavior is so entrenched that it is beneficial for the system to look for new forms for behavior. In the paper, by referring to empirical and experimental results, I will show how this mechanism works on different time scales: The micro scale of neural dynamics, the larger scale of language processing in for instance dialogues, and the macro scale of language change. In all these cases the feedback mechanism secures an amount of synchronization but the saturation secures that it will not be too much. For instance, the alignment principle advocated by Garrod & Pickering is dependent on the feedback principle, but the saturation secures that there still is room for language variations.

Riccardo Fusaroli & Kristian Tylén (Aarhus University)

Words, Actions and Hearts Beats: how five people become one Lego-model-constructing system

What happens when people jointly engage and manipulate representational artifacts for purposes of reasoning? How do they manage to coordinate and build a common ground? Which kinds of individual and collective cognitive processes are involved? In this talk we report from an experiment in which groups of participants cooperated to jointly construct LEGO models illustrating abstract concepts such as 'responsibility' and 'justice'. Participants' heart rate was recorded and their behaviors coded.

First we investigated behavioral coordination and we show that both verbal and building behaviors get increasingly coordinated between participants. Interestingly coordination grows also across modalities, with one participant verbal behavior becoming increasingly coordinated with the other's building behavior.

Second, we investigated physiological synchronization. We show that participants display increase in heart rate synchronization over time as modulated by two factors: the shared affordances of the task the participants are accomplishing and the increasing verbal co-ordination between them.

Third we are investigating group differences in the coordinative strategies developed and their effects on physiological synchronization.

We thus argue that participant groups, each in slightly different ways, increasingly become one LEGO construction system by tightly integrating their behaviors and synchronizing physiological indexes.

Sebastian Wallot (Aarhus University)

Understanding as a constraint on behavior: The dynamics of reading reveal a slow process in text comprehension

Reading in cognitive science and psychology is conceived as mostly a local process, where the main task of the reader is to 'crack' the orthographic code, understanding each word of a sentence at a time, which in turn gives incrementally rise to generation of meaning. At the same time, reading is conceived as a complex process, for which many sub-processes have to be orchestrated in order to yield comprehension and understanding. However, not much is know about the coordination of these processes and how they can be measured. In this presentation I will address how the coordination of cognitive processes during reading can be measured as they are reflected in response times and eye-movements during text reading. The results suggest that the comprehension of a text is mainly governed by the coordination of motor-cognitive processes that span several time-scales, not by the local aspects of word identification.

SIGN
EVOLUTION
ON MULTIPLE
TIME SCALES

ABSTRACTS
POSTER SESSION

Katrin Heiman, Maria Alessandra Umilta & Vittorio Gallese
How the motor-cortex distinguishes among letters, unknown symbols and scribbles. A high density EEG study

Previous research has reported that the perception of written language symbols activates the cortical motor hand representation of the dominant hemisphere also found to be activated during the writing of these symbols. It has been suggested that such motor activation supports reading. Nevertheless, the precise circumstances leading to such activation are still unknown. For instance, several studies suggested that motor activation necessarily depends on specific sensory-motor experience with the stimuli. Some results, however, also indicated that untrained stimuli can elicit the response. Moreover, due to the methods used so far, little is known about the temporal course of the motor activity. Our study explored these open questions using high-density EEG.

We measured central alpha event-related desynchronization (ERD) as a marker of cortical motor activation during the observation of Roman letters (alphabet of participants' mother language), Chinese characters (not familiar to participants), and scribbles. Our results show that the cortical motor system is activated during the perception of all three stimuli in both hemispheres, with ERD stronger in the left (dominant) hemisphere. A significant difference of ERD time-course was observed in the left hemisphere between the observation of symbols (letters and characters) and scribbles. Scribbles elicited significantly faster resynchronization of central alpha than symbols. We suggest that ERD results are due to recognizing all stimuli as traces of hand gestures. Furthermore, differences in ERD found between symbols and scribbles might depend either on visuo-motor training, separating symbols from scribbles, or on stimuli specific features marking their status as either language symbols or scribbles.

Catarina Isabel Grácio Moura (University of Beira Interior)
From Sign to Design

The idea of what is or what isn't possible defines a limit to the human action. An important limit, since it gives meaning a horizon, placing us, guiding us and thus functioning as a frontier between concept and object, imagination and reality, project and achievement. With limit comes a shape, the possible('s) shape, grounding us to reality. Consequently, limit informs, reforms and sometimes deforms.

Nevertheless, if understood as possible, limit, shape, is also possibility and, in that regard, what we thought to be closure may now be opening: opening to all possible(s), moving to the territory of poetics, of dream-driven action. Thought as ending, limit, far from being a rigid frontier, benefits from the semantic plasticity of this concept, emerging as *telos* – purpose, project, and objective. An objective not yet objectified, crystallised, and therefore settled as *meta* – which, in this case, can be *meta*-physics, since it still isn't and it's beyond physics, or *meta*-morphosis, change, mutation, transformation, revolution.

As sign of the ability to create, Design is project and intention towards the world, working shape as opening. Transformed by its poetic action, shape (*morphé*) is revelation (*alétheia*), reinforcing Design as a creative force through which possible, far from restraining, stimulates transformation, replacing natural by artificial laws and getting reality closer to utopia.

Accepted as opening, Design obeys to the utopic impulse that leads creation to the realm of all possibles, benefiting from the plastic potential of the new technological territories, where virtual is the new real and imagination approaches life. If understood as closure, Design becomes constriction, limit and stagnation, contributing to the creation of

an entirely visible, known and controlled universe, where the elimination of chaos, unknown, error and contingency equally eradicates surprise, the need to adjust and possibly evolution. In a time of ghosts, spectrums and quasi-objects, marked by the increasing sex appeal of the inorganic, to dive in the artificial universe of its creation, to *be* part of it, raises all sorts of possibilities, simultaneously utopic and distopic, reinforcing Design's aesthetical, ethical and political nature.

Drude von der Fehr (University of Oslo)
Being, Consciousness and Virtuality
In this paper I present a reading of the Norwegian writer Arne Lygre´s play *I disappear* from the point of view of consciousness seen as a result of an ever evolving evolution. I owe this point of view to Jesper Hoffmeyer and his latest book *Overfladens dyp. Da kroppen ble psykisk.* What I find at stake in this play are the following questions: Does identity as we know it stand at the point of disapperance? And, why is literature a preferable place to pose this question? Does the experience of a lifeworld dominated by possibility rather than actuality, in the long run do something to us as humans? Is it possible to live primarily in the constant anticipation of catastophical scenarios; fatal disease, accidents, terrorism, flight and death? In his book, Hoffmeyer introduces the concept of *interface* to be able to discribe consciousness´es character of not being anything in a material sense, but highly important in its capacity to interrelate between the *bodymind* (or *bodybrain* in Hoffmeyer´s words) and the surrounding Umwelt. The interface anticipates and has a certain semiotic freedom. What then with our main character in the play, who has a consciousness and an awareness of self and Being, but her life experience lies mostly in anticipation and she is not much in touch with an actual living world? The play both performs aestethically and thematizes our consciousness´es interaction with our current virtual Umwelt. Stuart Kauffman poses the following statement in an article from 2012 "From physics to semiotics": "We need an enlarged vision of ourselves and what we can become" (*Gatherings in Biosemiotics* 2012: 45). Arne Lygre´s play is a laboratory trying out both anticipation and freedom in the light of the question of what we can become.

Elisabet Malmström (Kristianstad University)
A semio-cognitive reconstruction of the sign
The process of learning to become and adequately respond to the complexities of the Self through handmade productions is unlikely to occur without guidance. The support of this paper's idea is the 'language turn' of education, from the 70s. It seems important that all students learn about art-action in an image-based global culture. Including how images are important forms of human expression in becoming. Thus all teachers need to know how they give instructions to stimulate thinking through students' languages of arts (style). Educational sciences of today might support this idea when a Peircean mode of education is giving support to a wide concept of the text including other semiotic resources beyond language. I proclaim a horizontal concept of the text for the same purpose of giving equal epistemological status to verbal and semiotic sign-action. For the purpose of stimulating humans' becoming, I argue for a pragmatic semiotic perspective and that language and visual action through handmade pictures do not only include the linguistic and the figurative picture but also the material used and its texture, a wide and horizontal view on communication. To find out about mediation of

different themes to connect *sign - action and mind* I build my idea on a hermeneutic 'figure of thought' of mediation made by the author; it is a semio-cognitive re-construction of the sign.

The students show unique ways of art in action, including means to *become unique*. The result shows features to the human's different processes of orientation to *sign-mindedness* and *style* through which meanings are accessible to becoming. Another result is that the zone of *proximal communication* between students and students' pictures/texture and teachers make difference to be seen in relation to the student's *ultimate* unique becoming. The result could be of great importance to aesthetic school culture in the future.

Gabi Lipede (Institut Jean-Nicod)
The end of aesthetic evolution: toward a macroevolutionary model of adaptive and null intersexual selection mechanisms

Recent transdisciplinary efforts to better understand the ultimate function of artistic creation and the aesthetic response have relied heavily on Zahavian formulations of costly signaling theory (Zahavi, 1997). The theory of costly signaling as applied to non-human ethological examples of proto-artistic and aesthetic behaviors imputes extrinsic, instrumental value to animal ornamentation, in keeping with Wallace's (1895) account of sexual selection, which holds that male ornaments are perceived and evaluated by females as fitness indicators. In marked contrast, a Darwinian formulation of sexual selection allows for the attribution of female aesthetic agency. According to this formulation, female choice is predicated on intrinsic features of the signal itself rather than on ancillary, instrumental values that the trait may or may not signal: parasite resistance, antipredator defenses, parental investment, etc.

Prum (2010) recently advanced the LK-null model of intersexual selection in a concerted attempt to rehabilitate and quantitatively model a Darwinian concept of aesthetic evolution. The LK-null mechanism yields a variety of arbitrary, unrestricted evolutionary outcomes. This contrasts with macroevolutionary predictions of evolutionary trends triggered by adaptive intersexual selection mechanisms, which are believed to constrain evolvability and limit the production of novel aesthetic variants.

The theory of costly signaling was designed to explain the existence of seemingly ostentatious and luxuriant phenotypes in non-human animals; however, the logic of the mechanisms that the theory postulates may predict the progressive elimination of the very behavioral and morphological phenotypes it was devised to explain. Consequently, the subsumption of art under the broader theoretical category of "costly signal" implies the expectation that aesthetic evolution will come to an end, insofar as costly signals tend toward a high degree of convergence between populations and the steady and progressive elimination of variation within populations.

In this paper I will show that the projected long-term effects of adaptive intersexual selection mechanisms, expressed in terms of constrained evolvability within and between populations, are structurally homologous to the projected evolutionary trends which emerge from the late Collin Martindale's most recent model of the psychodynamics of creative ideation and aesthetic reception (Martindale, 2009). Martindale anticipates the end of art. He conceives this broadly in terms of an evolutionary threshold beyond which the production of new aesthetic variants will no longer be able to keep pace with the aesthetic mandate of "meaningfulness" on which positive, hedonic evaluations of a given artwork depend. This Hegelian tragedy of sorts (Martindale, 2009), which pits art's relative novelty against its communicative value,

receives indirect support from the application of the theory of costly signaling to art and aesthetics insofar as costly signals tend toward the elimination of aesthetic variants in favor of communicative value. However, I will argue that the observations Martindale evokes in his argument for an upcoming "end of art" can be understood differently, in terms of the immanent vulnerability of human and biotic art worlds to the establishment of the LK-null mechanism (Prum, 2010) and, in the human art world, of the consequent inauguration of a new era of intrinsic, coevolutionary aesthetic evolution.

Gunnar Sandin (Lund University)
Art and the evolvement of culture. The altering capacity of institutional critique

Creativity is a principal force of cognitive and communicational genesis that causes alteration of established rules and concepts (Heine/Kuteva 2007) and transgression of cultural borders (Lotman 1990). Artistic activity is normally taken for granted as creative, despite the fact that much artistic intention, is not necessarily aspiring to make any radical change of the circumstances in which it is communicated. Still, the role of art in societies can be claimed to be of radical importance for human development. Art may historically, and indeed in several archaeological and anthropological perspectives, be seen as a shared cognitive resource and a projection surface for the self-conceiving of cultures. Thus, its representational capacity influences stabilisation as well as alteration of societies and their borders. Art has even been described as "a major factor in evolving the cognitive domains in the long history of the human species" (Donald 2006), and in this perspective art is to be regarded as an important "trigger" in evolutionary change, belonging in several stages of development.

If art in general has these evolutionary and extensional qualities, what then could be said about the self-questioning agency of critical art, sometimes labelled "institutional critique", i.e. art that beyond depiction or beauty aims at exposing the fundaments upon which it itself is collected, maintained, symbolized, economized? Through examples from contemporary critical art, it will here be discussed to what extent these activities alter their own culture. In view of the examples, creativity will be regarded – in order to distinguish it from mere problem-solving, and refinement of discipline – as a radically open-ended intention that may alter the comprehension of its own immediate context as well as of the context in a broad cultural meaning.

John J. McGraw (TESIS Network)
The Nawales Speak:
The Semiotics of Maya "Co-Essences" and the Doctrine of Signatures

Nawales, a set of twenty "co-essences" that influence the "nature of things," are a central feature of Maya spirituality. The cycle of days, ruled by the *nawales*, imbues time with a set of qualities, and each person—by virtue of the day of her birth—with those same qualities. The *nawales* structure space as well as time, so that everything in the phenomenal world has its "co-essence" with a particular *nawal*. One of the ways that Maya ritual specialists learn about the world is by determining which *nawal* "owns" or "rules" an object or place. This determination is aided by material signs and resemblances expressed by the *nawales*, a notion similar to the "doctrine of signatures" in the European tradition. In this poster, I will juxtapose the identification of *nawales* by Maya ritual specialists with the doctrine of signatures—best known through the work of Paracelsus, but more recently developed by Foucault and Agamben—in an attempt to

understand how cognitive predispositions related to the phenomena of *pareidolia* (i.e. "seeing faces in the clouds") and *apophenia* (imputing order to chaos) influence humans' understanding of the natural world.

John Z. Elias (University of Hertfordshire)
From Success to Correctness:
Linguistic Coordination and the Institutionalization of Practice

Work of the Interacting Minds group (e.g., Bahrami et al 2010, Fusaroli et al 2012), analyzing the linguistic interactions between two people jointly performing a visual discrimination task, provides a promising experimental paradigm to explore the role of language in the formation of institutions. Results show that well-performing dyads converged on a common, stable set of terms to communicate confidence, a process which might be described as the implicit institutionalization of a particular approach to solving the presented problem. That is, dyads tacitly instituted linguistic practices enabling them to better function as a problem-solving system. However, the emergence of such convergence does not in itself constitute an institution, in the stricter sense of a social organization in part created and governed by explicit rules. The transition from transient, emergent coordinative activity to instituted practices proper may occur when others are instructed about the task. Thus, given situations which select for successful communicative practices, instructions about such situations make explicit what was tacit practice, instructions which can then be followed correctly or incorrectly. This transition gives rise not only to a distinction between communication within versus communication about situations, but also between conditions of success versus correctness. These distinctions, as well as the possible benefits and detriments of institutions, are explored.

Niels Bandholm (Independent scholar)
Excavating the final sign in Royal Jelling – musing on semiotic epistemology

Reflections on the thought process, the succession of interpretants, which guided the discovery of *Squaring the Circle* as an archaic geometrical sign in Royal Jelling, Denmarks central world heritage site from year 958. A circle and a square with same circumference are interpreted as the "marriage of Earth and Heaven" can here be seen by mathematical minds, but its final interpretant is in the realm of history and archaeology.

Major revelations in 1½year:

1) Traces of a palisade seem straight.

2) Spot-checking the line leads to discovery of corners.

3) The corner-angle is odd and checks of the other side's make them ≈360m

4) The palisade-shape is a rhombus.

5) The diagonals are perpendicular and meet exactly in North Mound, integrating it with the palisade.

6) The rhombus seems to consist of 4 pair of 3-4-5 triangles ⁝ Other options excluded.

7) The height of rhombus is 24/25x360m = 1.5 Keops edge-length.

8) Area of rhombus is 11 times circular fortress of diameter 120m

9) Pi calculated as 864/275 · Fibonacci

10) Fibonacci number generate 864/275 and golden pi formula: pi=1.2xphi^2

11) 360m/phi^2 = 137.5 = distance between mounds.

12) Circumference of circle with diameter 137.5 = 432m = length of short diagonal.

13) Squaring the circle. South-mound just symbolic.

14) Angle of 26.6° indicates golden 1-2-√5 triangle.

15) Golden construction. Placement of great runic stone constructed exactly between mounds.

16) Geometric construction of pi=1.2xphi^2 generate the shape of Jelling rhombus.

17) Is this Geometric knowledge from Baghdad or is it dormant in Denmark since Bronze Age?

The thought-processes consist of increasingly comprehensive and accurate geometric ideas partially revealed by abduction. Every interpretant, is scrutinized of mathematical possibilities before it in turn is interpreted in a more general sign.