

Lyee Internet Information

Interview

Place: Kamakura

Date: Thursday, June 14, 2001

Interviewees:

Liliana Albertazzi, associate professor at Trento University, Italy

Roberto Poli, senior research fellow at Trento University, Italy

Gregers Koch, associate professor at Copenhagen University, Denmark

Laszlo Bela Kovacs, associate professor at Copenhagen University, Denmark

Negoro Fumio, president at The Institute of Computer Based Software Methodology and Technology

Moderator: Hamido Fujita, professor at Iwate Prefectural University



Koch

Kovacs

Poli

Albertazzi

Negoro

[Liliana Albertazzi]

1947	Born in Macerata, Italy
1973	Graduated in Literature at Urbino University
1980	Research Fellow at Bologna University
1983	Awarded tenure at Trento University, Faculty of Sociology
2001	Position requested as associate professor at Trento University (in course)
2001	Director of Mitteleuropa Foundation at Bolzano, Italy

Present ditto

Writing a PhD thesis provisionally entitled “The concept of Presentation in the Brentano School,” supervised by Prof. K. Schuhmann of the University of Utrecht

<Principal research interest>

Metaphysics, cognitive science, cognitive semantics, Gestaltpsychologie,

<Principal publication>

Ed. Meaning and Cognition: A Multidisciplinary Approach, Benjamins Publishing Company, Amsterdam 2000.

Ed. The Dawn of cognitive science. Early European Contributors, Kluwer, Dordrecht 2001.

Ed. The School of Alexius Meinong (with R. Poli and D. Jacquette), Ashgate, Aldershot 2001.

Ed. Unfolding Perceptual Continua, Benjamins Publishing Company, Amsterdam, forthcoming 2002.

[Roberto Poli]

1955 Born in Trento, Italy

1980 Graduated in Sociology at Trento University

1988 Appointed senior research fellow at Trento University

1993 Editor-in-chief of Axiomathes, a peer-reviewed academic journal

2001 Awarded PhD in philosophy at Utrecht University

Present ditto

<Principal research interest>

Ontology, cognitive semantics, theory of abstraction, philosophical logic, part-whole theories, levels of reality

<Principal research publication>

Alwis. The School of Alexius Meinong, 2001 (ed., with L. Albertazzi and D. Jacquette)

(+ 3 books, 14 edited volumes, more than 60 papers)

[Gregers Koch]

- 1944 Born in Copenhagen, Denmark
- 1968 Graduated from Copenhagen University, the faculty of natural science
- 1972 Appointed to associate professor, in computer science and computational linguistics, Copenhagen University
- 1988 Reader in computer science and computational linguistics, Copenhagen University

<Principal research interest>

Computational linguistics, structural language and semiotics of natural language, meta-parser (general-purpose method of grammatical analysis)

<Principal publication>

“Natural Language Understanding and Logic Programming”
II. 1988, III. 1999

[Laszlo Bela Kovacs]

- 1939 Born in Budapest, Hungary
- 1974 Awarded Ph.D in Mathematics/Operations Research/Combinatorial Optimization at Lorand Eotvos University of Sciences, Hungary
- 1979 Became Associate Professor at Lorand Eotvos University of Sciences
- 1985 Appointed Associate Professor at University of Copenhagen, the department of computer science
- Present ditto

<Principal research interest>

Logic programming & Prolog, Artificial intelligence, Knowledge-based- & expert systems, software development methodologies, object-oriented approach, operational research, urban planning, intelligent teaching and learning systems, psychology of learning.

<Principal publication>

Logic programming and applications
Design and decision support systems

Prof. Fujita: We are usually setting up interviews for the guests from abroad. I am pleased you join us. I guess that your understanding of Lyee has been deepened through the seminar of this week. Based on your understanding, would you tell us what you can contribute to Lyee through the project? A rough idea will do. I would also like to hear how your understanding of Lyee may have deepened your own thought on software and so forth.

Prof. Koch: I have enjoyed learning Lyee, and have a better understanding of it now. But I have to admit that the level of my understanding is not so high yet, almost at the same level as at my arrival in Tokyo. Details are still unclear not only in technical but also in philosophical aspects of Lyee. I feel I have to study more in order to fully understand it. As to possible contributions to the project, I may find a possibility to support Lyee by extending or enhancing some of the functionalities, as an experimental application of computational linguistics or computational semantics which is my special research interest.

Fujita: Lyee is a comprehensive methodology that is associated with a various level of issues. So, Professor Koch's comments are a bit too general because it is not clear which levels or aspects Prof. Koch does not really understand or is talking about. I would like all of you to make a bit more focused comments, please.

Prof. Kovacs: Before answering Prof. Fujita's question, I would like to say a few words. I am very much interested in Lyee's theory and I find it wonderful. I think a substantial understanding of its philosophy is necessary to really appreciate the method. That comprehensive understanding is indispensable to work with the development of the technical side of the method.

To answer to Prof. Fujita's question, I think I have got quite a good glimpse of the technical side of Lyee during this session in Japan. I heard that Lyee is used for business applications, but I think it should be used for other fields as

well. Otherwise the spreading of this technology outside Japan would be very limited. If it is exclusively used in business applications, the scope of Lyee's application will be too narrow.

I believe that Lyee should be associated with other methodologies. I suppose that it is difficult for one company alone to promote Lyee in the world.

I also think that Lyee has two directions to go. One is that Lyee will continue to be used as it is and be made better use of through version ups. For example, a large-sized database requires flexible access so that a new version of Lyee can be used for this.

Application areas with large databases should be targeted. The extension of the Lyee methodology to such areas seems be very useful. It is very likely, that the combination of Lyee with knowledge-based systems developed for these application areas would contribute substantially to the success.

There is one more point I want to add. One of my current research topics is a flexible representation of programs. This is a method that enables the order of program parts to be subordinate or flexibly expressed. I have already successfully experimented with logic programs. I think this has some common points with Lyee, so I want to examine them deeper.

Fujita: Do you mean order A is better than order B in terms of a semantic representation, for example? Are you interested in dependency that exists between one order and the other?

Kovacs: What Prof. Fujita mentioned is one of the aspects of the issue. In systems development, for example, higher level flexibility means that we can have new functions and new perspectives without changing the overall system, by using an incremental technique.

Prof. Poli: I became interested in Lyee when I heard that it is a software methodology developed from metaphysical ideas. Being a scholar working on ontology (in both its classical,

philosophical understanding and its new technological understanding), I took an immediate interest in Lyee. I believe that conventional methodologies depend on metaphysical or non-engineering hypotheses as well. Unfortunately, most of the people working with conventional methodologies usually deny any connection with or any dependence on non-engineering hypotheses. This means that some of their deepest beliefs remain unstated. On the contrary, Lyee explicitly declares its own non-engineering hypotheses. The difference between the two attitudes is very important. It is obvious to everyone that learning, criticizing, or modifying unstated ideas is a very difficult task. On the other hand, openly presented ideas can be learnt, criticized, and even modified, if necessary, in a much easier way.

I think that Dr. Negoro's choice to openly present the non-engineering ideas lurking behind Lyee is one of the greatest contributions Lyee has so far given to science.

I have read that a number of scholars claimed that Lyee's principles are unclear and very difficult to understand. This situation may derive from the fact that contemporary scientists share for the most part a positivistic attitude. Generally speaking, most contemporary scientists are no more trained in general philosophy and have lost the capacity to recognize the basic ontological principles governing their own disciplines. Let me claim that, as soon as you acquire some ontological competence, you may openly see that the conceptual framework of Lyee is unequivocal and clear. I am not saying that I am ready to accept it. What I am saying is that I have no difficulty in understanding its tenets.

Having said that most contemporary scientists may run into troubles when trying to understand ontological (or metaphysical) issues, I think this imposes a serious task on Lyee's part. As a matter of fact, Lyee's presentation needs substantial improvement. I think that up to now the original

Lyee's group has seriously underestimated the need and the importance of well-organized presentations. Both available papers and most of the lectures I have heard were poorly structured. Moreover, the chosen terminology is often improper and unnecessarily obscure. All this makes things unnecessarily difficult.

In order to improve the correct understanding of both the conceptual framework and the technical outcome of Lyee a series of as clear as possible presentations should be prepared. A step-by-step tutorial may be enormously helpful as well.

Prof. Albertazzi: As a philosopher, I am naturally biased towards the systematic features of our subject-matters. Since several years I adopted a theory of intentional reference in metaphysics, semantics, and cognition. I realized that my point of view has some common features with the ideas developed by Mr. Negoro.

I agree with Mr. Negoro's idea of the relevance of intentions, and I am deeply empathetic with his idea that intentions are an essential factor for capturing reality. In this sense, we share a common interest.

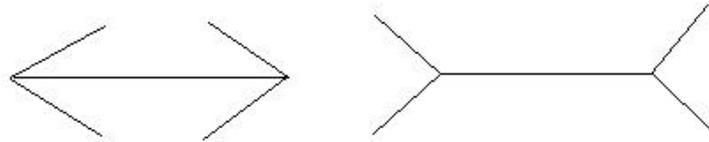
What may be different is the choice about the best way of developing the intentionality thesis: Mr. Negoro relies on some of Spinoza' and Wittgenstein's ideas, while I prefer to stay with Brentano and his followers.

Another point of difference may consist in the way to approach the problem of intention.

In developing the idea of logical atoms, for example, Mr. Negoro chooses, so to say, a *God-like* point of view, i.e. a universal point of view. On the contrary, I remain with the thinking subject, trying to understand both the emergence of intention within our internal world of representations and its ontological import. From this point of view, I am interested in understanding the nature of cognitive spaces and of the consciousness space in general.

For what concerns the tools that may be employed in such

an analysis, let me show with a few examples some of the differences between formal and cognitive spaces. The main reason for keeping them apart is due to the fact that they are grounded on different primitives. Consider the following almost trivial example (the Müller-Lyer illusion):



In these two figures the internal segments are of the same size, however, the horizontal segment on the right-hand side looks longer than the other horizontal segment on the left. In addition, the drawing on the right is overall bigger than the other one. This is an example that mathematically measured reality is not immediately identical with cognitive reality.

The main reason is given by the fact that in cognitive space the observer is part of the event and that particularly in perceptual space the Gestalt laws of organization are at work.

For what concerns the relevance of these observations to Lyee, I would suggest that in order to complete a systematic framework for Lyee, a theory of cognitive space should be developed, too.

Lyee's framework, in fact, refers to a very complex theory, which requires the scientific competence not only of engineers, logicians and mathematicians, but even of philosophers and psychologists.

The same problems which I hinted at in cognition concerns semantics, and in particular the semantics of natural language which governs the search for information. In fact, natural language expresses our internal points of view and has intrinsically cognitive features referring less to the physical world than to our internal representations.

- Negoro: It is abstraction that can be a concrete and practical theory to capture essence of things. When I explained Lyee this time, I put more emphasis on technical side of Lyee to Prof. Koch and Prof. Kovacs, while I put more stress on different aspects to Prof. Poli and Prof. Albertazzi. Why? My intention was probably different at that time. When I read Prof. Poli's paper, I felt honored to find that you were also conducting research into the same philosophers as I did. Suppose the target to be cognized is one set, we have to clarify an issue of an observer, i.e. who looks at the set. Two cases can be considered for this issue: one is that an observer belongs to the set; and the other is that an observer stays outside of the set. Depending on a position of an observer, what he/she thinks of the set is surely different. Abstraction only exists in theory. As you may be aware, I am committed to constructing a theory that an observer remains outside of all the sets. Lyee has a scenario function, the function that plays a role of the observer. All of you are giving invaluable advice to me, and I feel that should be reflected in Lyee. I feel quite honored that Prof. Poli understands Lyee in such a way that it takes a metaphysical and non-engineering approach to the handling of software. I am also grateful for the other professors' comments.
- Fujita: Let us then discuss the collaboration project. Prof. Koch and Prof. Kovacs have spent more than a week in Japan, and visited Iwate Prefectural University in Iwate. I guess that you have already wrapped up an idea for the collaboration to a certain degree. Would you tell it to us?
- Kovacs: Firstly, I would like to talk about a long-term and high-level view of Lyee and the project. Shortly before, Mr. Negoro focused on a technical side of Lyee to us. It is also necessary to talk about the philosophy or an overall picture behind the idea at a deep level. We have a much better basis to work with and develop

further the Lyee methodology when understanding its philosophy. Even though many things are not implemented yet, we will then find strategies, tactics, and detailed technologies with an eye on the present and the future. In this process, some technical insufficiency still exists, but I think it is ideal that we have an overall picture of the system and some parts are already completed.

In a nutshell, while we as human beings should avoid being put in a category of machinery, computers are to be positioned as an important tool supporting our thinking. I think computers can be employed as a support tool to conceptual human thinking without trying to standardize it. Thinking of these, urban design could be a challenging application for Lyee.

A next question may be in what way a current Lyee and an updated Lyee could be applied. Creative design is a human task. But complicated details in many variants may be followed by computers. I think to leave routine or mechanical parts of our work to computers. Computers should be used as assistance to our thinking, but we have not fully used these opportunities.

For example, communication with large databases does not require high intelligence. Writing unsophisticated SQL statements is not really a human work. A high-level language would be better for this purpose.

The more details we know, the better we can describe it in some language. So, the language shows clearly an obscure part of our knowledge. But going through several levels of a computer process, the sketchy parts will become clearer. In such a way, we can have intelligent communication with computers.

Consequently, I am able to concentrate on more intelligent parts in my research. Needless to say, we are not totally freed from technical details. I am pleased to challenge these technical difficulties. But, I hope that in the near future, we can concentrate more on human problems.

- Negoro: Shortly before, I discussed an issue whether an observer belongs to the set or not. I believe that without clarifying this issue, it is impossible to discuss a high-level relationship between computers and human beings. This issue is indeed philosophical, not an engineering one. More specifically speaking, when it comes to a high-level language, who makes it is also an issue. Does this person belong to the set? Or does he/she stay outside? Unless solving this issue, a high-level concept cannot be established.
- Kovacs: Of course, it is beyond our imagination that human beings are sacrificed for computers' intelligence to be improved. Since human intelligence is way higher than computers', we can enhance the intelligent nature of computer language or the intelligence itself by incorporating a model or a simplified form of human thinking into computers. This in fact will make human thinking even more sophisticated.
- Fujita: How about the collaboration project? You have already given me a two-page paper, and please tell us the summary of it.
- Kovacs: I have written two more pages, though. Anyhow, there are two points I want to make: One is that I think a language can be constructed in such a way that it does not need to express a sequential order. This is possible with Lyee and logic programming which I am committed to. I want then to examine the best sequence as a dynamic task for the inference engine.
- The other point is related to application fields. A present Lyee does not have a tool for urban design. But Lyee is used for developing systems with large databases, and has a strong screen communication capability. I hope that Lyee can be successfully integrated with other systems.
- Negoro: Your mentioned the best sequential order and this is also a very interesting topic. According to the principle of Lyee, however, we are unable to find it. This is associated with an issue of the observer. Only God may be entitled to

know it. Thus, I thought that it would be easier to construct a theory based on an idea that a sequential order is to be deleted from our thinking. This is how Lyee stands on.

Kovacs: If there is a gap between our ideas on this issue, I am thinking of logical semantic relations. Logic programming ignores sequential order, and does not even care about differentiating between input and output arguments. But when it is used in practice, the processing speed may slow down so that we do not get any solutions at all. I am interested in what kind of dynamic reasoning should take place when the programs are implemented, so a meta-programming view of the sequential issue will be a theme of my research.

Koch: Here I am thinking of natural language extension to Lyee, and I imagine two kinds. One kind is a natural interface, a preprocessor for the Lyee meta system handling limited fractions of natural language. Although it will be experimental, it may be considered a set towards an enhanced level of automation. The other kind is a strictly technical matter. It concerns the building of new internal functionalities, adding a logical semantic parsing facility. This will give Lyee some new internal functions.

The above-mentioned two additions are technical issues, in particular the second one will be a technical detail in Lyee, and they will be of a highly experimental nature. But they still constitute an experiment of adding new useful functionalities to the system.

Finally, I should like to point your attention to the possible abuse of this kind of future systems: a Lyee type of system enhanced with strong linguistic capabilities may even show themselves useful for purposes of espionage.

Fujita: We have just heard a general framework of the joint research project by the professors from Copenhagen. This is an initial phase of the plan for the project so that I am sure their ideas centered on technical issues will be polished after they

go back home. Dealing with semantics in natural language is eventually possible because of the scenario function. However, what they are suggesting is regarding syntax. Since Lyee does neither have a grammar, nor use verbs, this part may be complemented and integrated by other tools. I heard that Prof. Poli has a bit more specific proposal for this issue. Would you please tell us?

Poli:

As far as the issue of concrete proposals is addressed, I may present one short-term proposal and two long-term ones. The first and short-term proposal is, as I previously mentioned, to prepare a set of well organized presentations and a Lyee tutorial. Lyee terminology should be properly modified in order to facilitate its understanding and diffusion. This is a primary task. Unfortunately, I have the impression that the relevance of this kind of efforts is somehow underestimated.

Regarding the long-term proposals, I am thinking of two of them. The first one concerns the development of the non-engineering aspects of Lyee. The work till now done may be properly deepened and even more powerful hypotheses may be developed. I wonder if it would be possible to form a group of scholars interested in this problem. Both I and Prof. Albertazzi are willing to do our part of the job.

The second proposal is directly linked to the topic of ontology, to which I am highly committed as well. Many of you may know that contemporary ontology presents two sides: in one sense it is part and parcel of philosophy (according to classical philosophy, ontology is the core of the discipline); in the other sense, ontology has become a technological discipline concerning knowledge sharing, integration and merging. Ontology therefore is both a non-engineering and an engineering discipline. It is a natural bridge between philosophy and science. Prof. Kovacs hinted something very similar, providing I have understood him correctly. Anyway I am interested in

working on the edge between non-engineering issues and technical applications.

Albertazzi: Among the many research projects I am actually developing, my present main concern is to analyze the relations between cognitive space and natural language. There is a close link between a theory of cognitive space and a theory of cognitive semantics indeed, since in natural languages are embedded Gestalt schemes of conceptualization.

Take two sentences like “the leaves are falling down from the trees” and “the fall of the leaves”. The two sentences seem to convey the same message from a truth-theoretical point of view, however their focuses and consequently their meanings are different. The former expresses a process, while the latter provides an atemporal image of the same. Natural language, in fact, is able to represent the events in question either by focusing on the duration of the time of the event or on its static momentary schematization.

Both operations are analyzable on the basis of the structure of intentionality of consciousness. It is in fact possible to explain why the event is expressed in multivocal ways in natural language and which are the differences in meaning between the two or more conceptualizations.

The example aims at underlining, in this case, that not everything of reality can be grammatically conceptualized by nouns. As a matter of fact, in my view, the basic structure of reality is more event-like rather than object-like.

Negoro: I am very much pleased to work together on high-level issues such as a relation between computers and humans. The problems and issues that Prof. Poli and Prof. Albertazzi have pointed out indicate that we must make the theory even more sophisticated to sustain the practice. So, I truly appreciate you are making important and wonderful proposals. In addition, problems that we cannot handle easily, including the example that Prof. Albertazzi has shown, and an issue of which position we can stand on at the time of conducting a language design are eventually

summarized as an issue of the observer. With clarifying the issue, I think a computer-and-human relation will be clear.

With the Lyee method, software is produced only by words. Those words take a role of an observer staying outside the set. A concept of vectors produced with Lyee represents a structure in which an observer looks at the set from outside. Prof. Albertazzi talked about examples of the leaves. I think in both cases of the leaves, an observer remains outside the set or the leaves and the observer belong to different sets respectively.

Lyee is supposed to represent phenomena when the scenario functions are executed on a computer after the variables of those are substituted by nouns. This is a basic idea of Lyee toward making programs. Let me summarize the procedure of making programs with Lyee. You will pick up grammatically defined nouns from ordinary sentences written in natural language. Those nouns are placed on three pallets. Each word placed on the three pallets is then redefined according to ten kinds of structures called vectors. This is how the scenario function is established. I am claiming that the scenario function is universally valid, in other words, what the scenario functions produce do not contain errors. That is to say, the scenario function succeeds in placing the observer, who is only allowed to belong to the inside of the set, outside.

Before closing, I want to say that I am not very good at explaining things. So, I sincerely hope all of you will cooperate with us to fill in this insufficiency to make Lyee more solid and sophisticated. Thank you very much.

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