

Suave Radicals

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Abstract

We engage in some light looking back on the work of Groenendijk, Stokhof and Veltman, raising a few thoughts about the intellectual trajectory of our shared home, the ILLC.

Retire, or advance? The Dutch retirement system writes successful actors out of the script with their series still in full swing, and their public approval ratings still going up. Therefore, despite the farewell ceremonies to come this month of December 2013, the saga of Jeroen Groenendijk, Martin Stokhof & Frank Veltman (GSV, in what follows) is by no means over. Still, on this festive occasion, I am happy to congratulate them with their achievements. I will back this up by engaging in some looking back on their work, in the form of a few light thoughts about our intellectual history at the ILLC. Yet I am painfully aware that each theme raised would deserve much more attention than it will get here.

Language and informational action GSV started their research career in the 1970s in a climate dominated by two major influences: philosophical logic, and the semantics of natural language. The two fields had long been developing in close contact, though there were (and still are) tensions between natural language philosophy and formal language philosophy as two main prongs of the analytical tradition. A seminal influence at the time was the work of Richard Montague, whose mathematical approach seemed to overcome old divisions, since natural and formal languages, properly understood, had the same essential structure in his view. GSV positioned their work inside the intellectual space created by Montague, Kamp, Lewis, Stalnaker, and other pioneers of semantics and philosophical logic and they have often stressed this indebtedness. But what strikes me, looking back, is the radical nature of the innovations in their work, which cannot all be reduced to following role models.

While the inner sanctum of the Montague system are eternal homomorphisms between the algebras of natural and formal languages, GSV started looking at the dynamic agency behind natural language, as was also done by Lewis, Stalnaker and Kamp, but quickly developing one seminal new theme after another in their own distinctive style at the interface of semantics and pragmatics. One of these themes is the nature of information, perhaps the main currency created and conveyed by natural language. Look at the data semantics of Veltman, or the early work of Groenendijk & Stokhof with van Emde Boas on knowledge, and you will see how this played around 1980. The other main theme, forming a natural unity with the first, is communication between language users, which eventually led to dynamic semantics of the 1980s and 1990s, with classics such as Dynamic Predicate Logic and Defaults in Update Semantics where the potential for changing hearer information is at the heart of the meaning of linguistic expressions. These ideas were developed by paying close attention to carefully selected facts from natural language, concerning anaphora, questions, and conditionals, the way expert geologists detect the presence of gold seams by looking at small, but telling facts of rock coloring or vegetation. In doing all this, GSV achieved something that is rare for academics: they set the international agenda of research of their field, instead of following it.

Radicals versus conservatives Dynamic semantics of natural language is something so large that it is visible from other fields. In particular, I keep thinking about what the GSV approach means in terms of pure logic. If one views the very meanings of linguistic expressions as tied up with their role in information exchange, then a radical shift takes place toward reinterpreting classical logical operators and classical consequence. This leads to new non-classical logics whose differences with classical principles (both in terms of presence and absence of familiar laws) encode the dynamics. By contrast, my own work on dynamic-epistemic logics of information has tended to become more conservative, keeping standard meanings the same, and adding new vocabulary for axiomatizing informational actions formalizing the pragmatics, if you wish. This difference in methodology may seem slight, but it has major effects on the notions and systems one ends up with, embodied in two different milieus at the ILLC. I cannot do justice to this bifurcation in approaches or temperaments here. In a historical mood, let me just draw an analogy with our local history of logic. Brouwer and Heyting were radicals reinterpreting the base language of mathematics to arrive at non-classical intuitionistic logic. As an alternative line, one can see the main modal logic tradition in Amsterdam as adding operators for new notions, rather than changing the classical base. Of course, there are connections between the two styles of working, but if you really ponder links like the Gödel translation from intuitionistic to modal logic, you will quickly find that what look like close formal systems can be conceptually worlds apart. The way I currently see it, borrowing a distinction from my work on logic and games that is emerging in other realms as well, dynamic semantics suggests a conception of logic *as* dynamics, whereas, say, dynamic-epistemic logic exemplifies logic *of* dynamics. While I am not sure whether this distinction is the whole story of the interconnections, it should suffice for making one see that pondering the diversity of major ILLC research lines has its own rewards. But my much simpler point is that, if you accept my analysis, GSV are the true radicals of Amsterdam, continuing the grand intuitionistic tradition.

What is natural language? Natural language has been the key locus of research in the GSV school, and “logic and language” is a trademark of our Amsterdam environment. An issue that inevitably arises then is the historically changing role of natural language in our environment. A few decades ago, the relevant facts of natural language were produced by the same theorists whose systems were at stake, in the form of judgments of well-formedness, possible readings, or supported inferences. And the locus for such judgments were mostly sentences. Many of these things have started shifting, with beginnings already visible in those roaring 1970s. First, the more we look at the GSV information dynamics of communication, the less obvious it seems that everything of relevance is located in the syntax, and indeed, the combination of syntax and context becomes the major unit, changing ones view of what is the natural phenomenon one is studying. Is natural language an algebraic code system, or a set of practices? Can we separate the role of strict grammar and broader discourse logic? For instance, what does it mean to translate one language into another in the sense of such a broader practice? My own teachers told me as a student that language is a medium for describing the world, with complex expressions perhaps matching complex facts about the world. But if we follow the dynamic agenda shift, it may be the functional view of language as a medium for achieving cognitive goals such as communication or persuasion that is central. This is in fact what is happening in current game-theoretic approaches to language, very much in evidence at the ILLC as a follow-up to dynamic semantics. It also fits with recent views in cognitive science that the brain is a belief-changing machine in communication. And while these shifts have not yet led to an extensive theory similar in splendor to classical logic-based semantics, new links with game theory and dynamical systems theory may add power that was not available before.

Should the empirical facts matter? At the same time, a much broader range of facts about natural language use has become available to challenge and inspire formal semantics, from corpus data to cognitive experiments. How do the empirical facts affect us? One can retreat behind old competence-performance or descriptive-normative distinctions and protect one's theories, restricting the judges to philosophically inclined referees of journals, rather than the doings of natural language users. The same is true for dynamic logics of information by the way: immunized as normative laws of information flow, or moving closer to empirical research. The onslaught of cognitive reality is a common challenge facing many research milieus at the ILLC. I am not sure whether there is any received view in our circles yet. Some authors in formal semantics (including one of GSV) have written sophisticated articles on what it is that semantics, or logic, really achieves. But still I sometimes sense a precarious balancing act between staying with a priori philosophy and engaging in risky empirically refutable claims.

Organizational talent One often hears that logic and language in Amsterdam forms a "school", with dynamic semantics as one of the major highlights that attract students from all over the world. Now the epithet of academic school is often bestowed quite freely, when a few students have gathered around a teacher and talk, more or less successfully, in a similar style. But a real school is a mob with an institute. And indeed, much more can be said in the case of GSV who have been talented teachers and organizers from the start. One of the best tests for their organizational success is the staying power of what was set into motion. Well, for a start, the Amsterdam Colloquium was started by GSV around 1975, and it is still with us as a major venue where the international semantics community meets. And then there is the ILLC, which owes a lot to this core group, and would in fact have been unthinkable without the GSV imprint. Having an interdisciplinary logic institute flourishing as it does, against the laws of academic entropy, is a small miracle, which has by now lasted for more than 25 years. Add to this the major role of GSV in initiating the European ESSLLI Summer Schools, and the running of the first large-scale international European Community research project DYANA in our area, and you will see that formal semantics in Amsterdam is also social action.

Whither the ILLC? Of course, organizational persistence does not mean faithful following of any original lithurgy. For instance, where is the ILLC going, now that its founding generation is retiring, whatever that verb may mean precisely? First, the institute has already produced many themes that were not in the original charter, such as games, learning, computational social choice, or quantum information. And some of the most conspicuous research at the institute today, even that centered around natural language, breathes an atmosphere that is quite different from the philosophical-logical spirit of the original formal semantics. I find it intriguing to see where all this will lead, as the institute is absorbing an ever-larger dose of cognitive science, and as the purity of logical methods gives way to the intriguing interfaces of logic and probability today, where the demands of practice meet the challenges of basic theory – perhaps even all the way into the ILLC tradition in the foundations of mathematics.

Onward to broader culture To this story of undiminished success, I must add one qualification. It has been a hallmark of many academic innovators that they also enjoyed a broader cultural outreach. In particular, given that natural language is a topic so close to many people's hearts, filling large public lecture theatres in our country whenever a general talk is announced, one would expect a broader cultural significance to the GSV paradigm, which ties in with so many exciting interdisciplinary things happening in academia, and at the same time, with our own daily experiences. Some linguists and cognitive scientists have achieved this broader

cultural status in public fora and cultural magazines, from Chomsky to Pinker, or in The Netherlands, from Brandt Corstius to Levelt and Hagoort. I see this as important, not as a way of selling our research, but as a key aspect of responsible academia: taking active part in the cultural life of the nation. Now, it is a real mystery to me why dynamic semantics and other innovative ideas cooking in the GSV school have not achieved a similar cultural status. Their content has all the quality and appeal that it takes. I also believe that, qua eloquence and stage presence, the GSV trinity has all it takes. Perhaps their coming retirement can be a gentle signal to allot the coming time free from academic routine to such broader goals.

Finally: beyond information Given the mission statement on its website, the UvA Institute for Logic, Language and Computation seeks its identity around the notion of information structure and its transmission, with a special role for logic and computation – and this is still largely true, give or take a few buzzwords. But what is also true is that the above-mentioned successful uses of natural language, action, and social organization involve much more than pure information flow. Even the purest intellects need to be motivated and appreciated in order to flourish. An intellectual school assumes not just informational synchronization, but emotional resonance, and to some extent, the same is true of an institute. I leave it to future historians to set forth how all this has worked precisely to create the ILLC, but what is clear is that not just the ideas, but also the personalities of Frank, Jeroen, and Martin have played a crucial role in shaping and maintaining what it is now the natural habitat for so many of us.